conversions

Ford

INSTALLATION MANUAL

1966-77 Bronco
Bronco II 2 & 4 wd
Ranger 2 & 4 wd
460 V8 full size
Explorer

This Book Contains:

V8 swap info.
Transmission conversions
Installation Photos
How-to Articles

ADVANCE ADAPTERS INC.

www.advanceadapters.com

Booklet No. FMC014

October 1, 2006

P.O. Box 247
4320 Aerotech Center Way
Paso Robles, CA 93447

This *fourteenth* edition of the Advance Adapters Ford Engine Conversion Manual is an accumulation of our experiences and knowledge in performing various types of conversions. The information and photos are directly related to the products offered by our company. We have put this manual together for your reference in either performing the actual conversion or trying to establish an estimate on tools required for your specific type of conversion. There are several reprint articles that have been supplied to us through the courtesy of various magazines. The information in this guide is constantly being updated and we ask that you verify any information that may be critical to your application. We also recommend that you acquire the individual shop manuals for your particular vehicle as support for torque specifications, gasketing, wiring, and assembly specifications which pertain to your vehicle's requirements.

SPECIAL NOTE: Catalog Contents

This manual has been put together with the best possible information available to us. Advance Adapters cannot accept the responsibility for vehicles and applications that are not standard. The contents of this brochure have been proofread before printing to minimize errors. We cannot be held responsible for errors overlooked. Please feel free to contact us with any suggestions or comments you may have regarding any portion of this manual. The information that you provide us could be useful in assisting other customers.

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FORD SPOTTERS' GUIDE

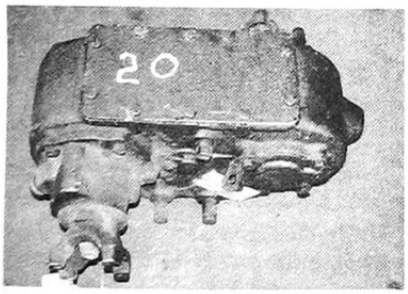
EVERY TRANSMISSION, TRANSFER CASE AND AXLE

By Mike Reynolds

PHOTOGRAPHY: MIKE REYNOLDS

For you Ford fans, *OFF-ROAD* put together the most comprehensive guide to every automatic and standard transmission, transfer case and front and rear axle that was offered for Ford 1/2-ton 4x4 pickups and fullsize Broncos manufactured between 1971 and 1991. Though technically 1/2-tons, this guide will exclude Bronco IIs and Rangers. This is the second segment of our Spotters' Guide series. Last month, as you might remember, we compiled a similar guide just for Chevy enthusiasts.

TRANSFER CASES

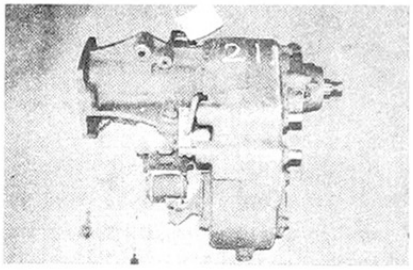


Dana Model 20

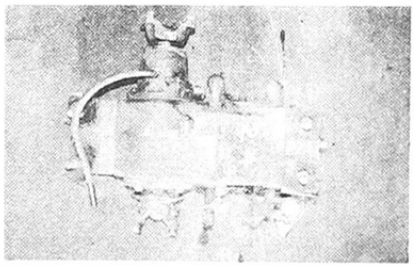
The Dana Model 20 is a two-speed, cast-iron, gear-driven transfer case used in Broncos from 1966 through '77. This case was made in three versions. The Ford version has the front output shaft on the left and has a low-range reduction of 2.0:1. The 2.46:1 low-range gears from the Dana 18 are commonly swapped into the Dana 20. Positions are: four-wheel low (4L), neutral (N), two-wheel drive high (2H) and four-wheel-drive high (4H).

Dana Model 21

The Dana Model 21 is a single-speed, cast-iron, gear-driven transfer case. It was only used in the F-100. It has two positions



and they are: front axle engaged and front axle disengaged, (it does not have neutral or a low range). Model 21 offers a 1:1 gear set.

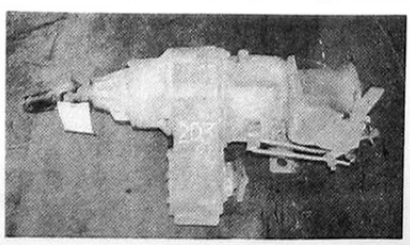


Dana Model 24

The Dana Model 24 is a two-speed, cast-iron, gear-driven transfer case. It is a heavy-duty unit that was used mostly in 3/4-ton applications. But some made their way into 1/2-ton trucks. It has four shift positions and they are; four-wheel low (4L), neutral (N), two-wheel-drive high (2H) and four-wheel-drive high (4H). It's low-range reduction is 1.86:1.

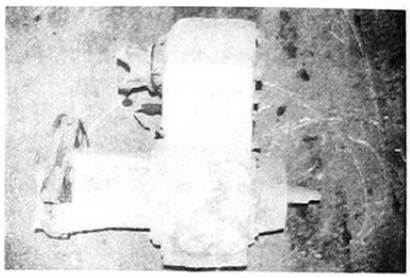
New Process Model 203

The New Process Model 203 is a full-time 4WD transfer case that incorporates a



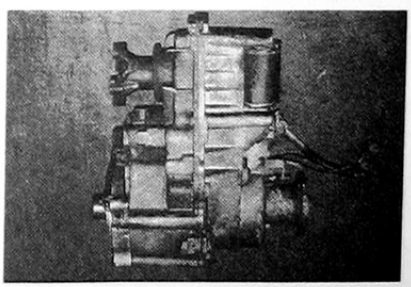
center differential. The differential compensates for speed variations between the front and rear axles when cornering or driving on slippery surfaces. It is chain driven and has a cast-iron case. The 203 has five shift positions: Neutral, High, High Lock, Low and Low Lock, with a low-range ratio of 2:1. The Lock positions, lock the center diff to split torque evenly (50/50) when off-roading. This case is distinguished from the part-time NP 205 by its single-piece rear output housing.

Part time conversion kits are available. Doug Nash made a good one, now sold by Mile Marker (800) 426-8646.



New Process Model 205

The New Process Model 205 is a two-speed, part-time, cast-iron transfer case. Many experts say this unit is the strongest transfer case ever built. It is gear driven and it has a 2:1 low-range ratio. It has four shift positions and they are four-wheel low (4L), neutral (N), two-wheel-drive high (2H) and four-wheel high (4H). This case is also available in several versions and has been used in IHs, Chevys and Dodges. It's available in either right or left outputs for the front shaft, so care should be taken to ensure you buy the correct version.



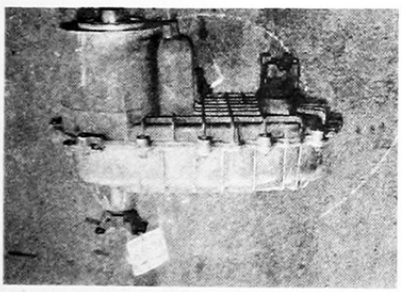
New Process Model 208

The New Process Model 208 is an aluminum case, planetary-gear reduction unit with a 2.61:1 low-range ratio. It uses a chain to drive the front output shaft. It's popular for its low weight and deep low-range ratio but it is not as strong as the 205 it replaced. Beware of Jeep versions that have the same

spline and bolt pattern as the Dana 300. The High-Low shift fork is known to wear quickly. Left and right models are available. Keep the case full of clean oil and don't let it overheat.

Borg Warner Model 1345

Borg Warner's Model 1345 is an aluminum case, two-speed transfer case that's chain driven. It was used in 1980 through '88 fullsize Fords. This is a good transfer case for 4x4s that will be flat towed frequently because it has a built-in fluid pump and oil channels. The low-range ratio is 2.74:1. The 1345 is mechanically shifted and has four positions: four-wheel-drive high (4H), two-wheel-drive high 2(H), neutral (N) and four-wheel-drive low (4L).



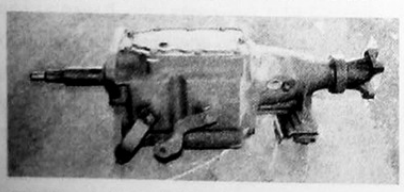
Borg Warner Model 1356

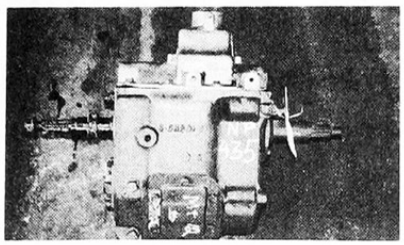
The 1356 is a magnesium case, two-speed transfer case that is chain driven. It came in two models; manual shift and electric shift. The electric shift model uses electronically controlled servos. The low-range ratio for both is 2.69:1. The 1356 is the 1345 replacement.

STANDARD TRANSMISSIONS

Ford Three Speed

The Ford Three speed was used only in early Broncos. It has a cast-iron case and is a full synchromesh transmission. This transmission is nearly bullet proof. It can withstand many years of abuse with few failures. Pictured is a 2WD version. The difference is in the tailhousing. First-gear ratio is either 3.41:1 or 2.99:1 depending on version.



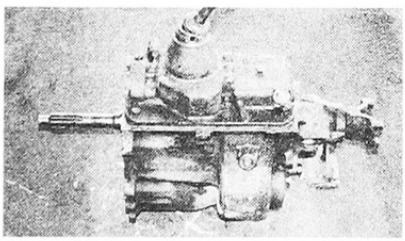


New Process Model 435

The New Process Model 435 is a cast-iron, four-speed with a "granny low" (6.69:1). This transmission can be found in Broncos and F-150s.

Ford 4 Speed OD

The Ford four speed OD was used from 1982 through 1987. It was not very strong or popular and it did not have a granny-low first gear. It has an aluminum case and was mostly used in 2WD applications, however a few did trickle down the assembly line in some 4x4s, mostly in 1987 F-150s. First-gear ratio is 3.29 or 3.01, depending on year.

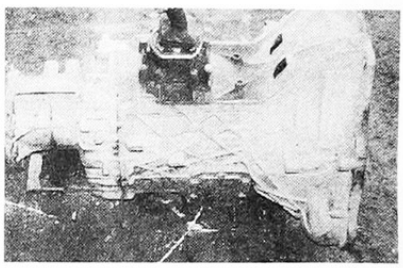


Borg Warner T-18

The T-18 is a cast-iron case, four-speed with a granny-low first gear. It's popular among four wheelers because of its 6.32:1 first gear. A nice feature about the T-18 is its power take-off (PTO) on the right side of the case. Borg Warner also makes a T-19 that is very similar in appearance but only found in the 3/4-ton and larger trucks. The T-19 was heavier-duty than the T-18. An easy way to distinguish the difference is the T-19 has a PTO cover on both left and right sides of the transmission. T-18 were also used in Jeeps and some Scouts, but none are interchangeable.

Mazda R-2, 5-Speed

Mazda R-2 is a five-speed aluminum case light-duty transmission. It can be easily identified by its rectangular shape casting ribs and it also has a large top cover. The R-2 is known for leaking oil from a rubber plug in the top cover. If you have one, I recommend you replace that rubber plug with a steel Dorman cup plug PN# 555-108 (it looks like a miniature freeze plug). If the tranny runs low on oil it will melt down — something they do often.



Ford ZF 5-Speed

The Ford ZF is an aluminum-case medium-duty 5-speed. It can be easily identified by its diamond-shaped casting ribs and by its small 4-bolt top cover. Much like the R-2 don't let it run low on oil. First gear is 5.72:1.

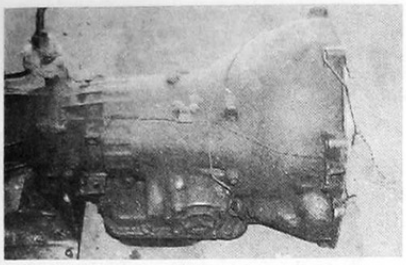
AUTOMATIC TRANSMISSIONS

C-4

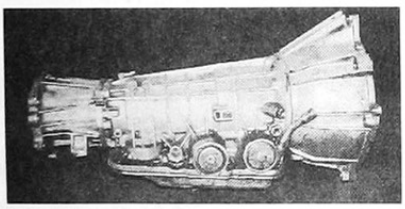
The Ford C-4 is a 3-speed automatic found mostly in six-cylinder Broncos and F-trucks between 1963 and '82. It was fairly rare in 4x4s, but it had many 2WD applications. The C-4 is a light-duty transmission, however it can be beefed up to handle rigorous abuse. Many racers prefer this transmission because it is small (17-inch case), lightweight and easy to work on. The pan has 11 bolts and two bellhousing designs were offered. There is also a C-5 which is basically identical to the C-4, but the C-5 has a lock-up torque converter. The C-5 is found in Rangers from 1982 to '84 and in fullsize trucks from '82 to '86. The C-5 is distinguished from the C-4 by a hump in the oil pan. The C-5 was primarily used in two-wheel-drive trucks.

C-6

Ford's C-6 is a heavy-duty 3-speed alu-



minum case transmission that's very popular among 'wheelers and racers for its strength and durability. The case measures 20 inches and the pan has 17 bolts. The tailhousing on 4x4 version is made of steel. Three bellhousing patterns are available. The first-gear ratio is 2.46, but lower aftermarket gear sets are available. It has problems with the intermediate band breaking under extreme conditions. Latter versions have improved bands. Early Lincoln C-6s had a high-gear clutch pack that held five plates instead of three, however it is obsolete and hard to find. The C-6 overheats easily, so a quality aftermarket cooler is recommended.

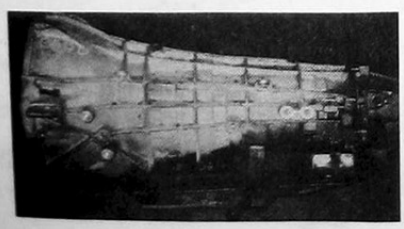


AOD

The Ford AOD, (A.K.A.) AOT and FIOD is a 4-speed automatic with overdrive. It is a light-duty transmission that evolved from the C-4. During its first few years of production, much like the 700 R-4, it had its share of problems. They had a weak planetary-gear set, they exploded under stress. There were also problems with the input shaft clearances, but most tranny shops know how to swap the planetary-gear set and beef up this transmission. Once beefed it's a reliable transmission. The AODE is very similar to the AOD, only it is computer controlled with a lock-up converter. First-gear ratio is 2.40:1.

E4OD

The Ford E4OD replaced the AODE. It is a 4-speed overdrive, computer-controlled



transmission with a lock-up torque converter. Its roots are traced to the C-6. It is a heavy-duty unit. First used in 1990 and has evolved through many valve body and case changes. The overdrive sprag was weak and the forward planetary-gear set was also weak. Both these problems can be fixed by being fitted with improved units. The first gear ratio is 2.70:1.

AXLES

Dana 44

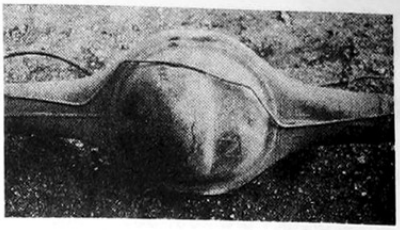
The Dana 44 is one of the most popular axles around. Broncos from 1972 to '77 and all pickups had standard rotation Dana 44s up front but later solid-axle Broncos used reverse rotation ring and pinion gears. The reverse setup is good because the pinion's centerline is above the ring gear's centerline as compared to non-reverse Dana 44s. The benefits are increased clearance and fewer driveline angle problems. However, running on the backside of the gear reduces strength. Aftermarket products such as alternate ratios, stronger axles, limited-slips and lockers are available. The gear split is at 3.73. A few trucks sold in Mexico had Dana 44s in the rear.

Dana 44 IFS

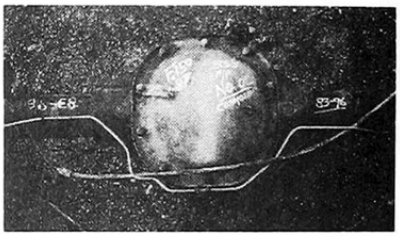
The Dana 44 IFS is the heart of Ford's Twin Traction Beam suspension (TTB). It doesn't use a reverse spiral ring gear. It is a stout unit and benefits from strong aftermarket support. The Dana 44 IFS is a popular swap into IFS Rangers and Explorers.

Ford 9-inch

Ford's 9-inch axle is among the most popular axles available. It is easily recognized by its stamped-steel housing and removable gear carrier (Toyotas use a similar arrangement). It is very strong and versatile.



Aftermarket parts are plentiful and virtually any axle ratio is available. It is nearly equal in strength to the Dana 60 but it is lighter. They came with 28- or 31-spline axles, 31 being was strongest. Still stronger 35-spline axles are available from suppliers such as Currie Enterprises. Another advantage to the 9- and 8.8-inch Fords is that there are no gear splits (the need to change carriers at a certain ratio).



FORD 8.8

The Ford 8.8 is similar in design to the Dana 60 but less desirable than the Ford 9-inch or the Dana 60. It is easily distinguished from the 9-inch because it has a 10-bolt inspection cover and center section is cast with pressed-in tubes. Aftermarket parts are readily available. **OR**

SOURCES:

Advanced Adapters, Dept. OR,
1645 Commerce Way P.O. Box 247
Paso Robles, CA 93447
(805)238-7000

Eickhoff Industries, Inc., Dept. OR,
9800-D Topanga Canyon Blvd., Ste. #360
Chatsworth, CA 91311
(818) 715-9113

Power Train Industries, Dept. OR,
7602 Anthony
Garden Grove, CA
(714) 893-4585

Scotty's Jeep, Dept. OR,
Truck & 4x4 Dismantling and Sales,
14349 Whittram Ave,
Fontana, CA 92335
(909) 829-2913

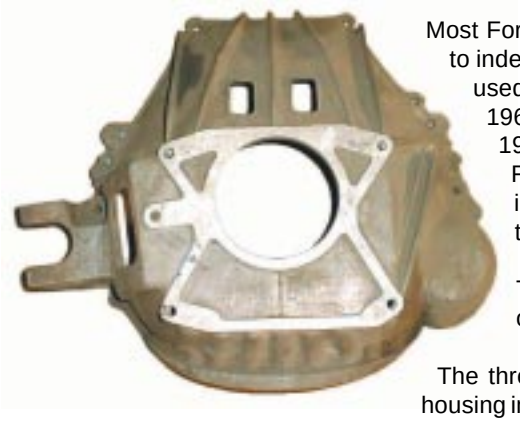
The Hollander Interchange Manual, Dept. OR,
ADP Parts Services
P.O. Box 9405
Minneapolis, MN 55440
(800) 825-0644

T&Y Truck Dismantling, Dept. OR,
15303 Arrow Route
Fontana, CA 92335
(909) 823-3461

Webber Transmissions, Dept. OR,
12391 Sampson Ave.
Riverside, CA
(909) 734-8850

Engine & Bellhousing Information

Ford blocks used three different block bolt patterns. This manual deals mainly with the small block Ford 289, 302, and 351W; the Ford 302 being the most commonly used block for conversions. Information on the big block 429 & 460 is found on **Pages 34 through 37**. It is imperative that the engine you select has the dowel pins installed to achieve proper alignment (see photo right). When dealing with the alignment of the bellhousing to the block, many service manuals recommend the bellhousing be checked with a dial indicator. This insures that the engine crank is properly aligned with the retainer index of the bellhousing. Reference any Ford service manual for this procedure.

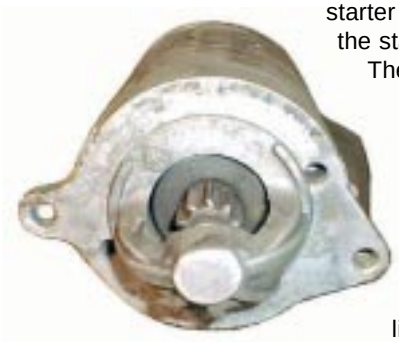


Most Ford manual transmissions use a retainer to index the transmission to the bellhousing. Ford used three different index diameters. Vehicles 1965 to 1970 used a 5.125" diameter, vehicles 1971 & newer have a 4.848" diameter, and the Ford Mustang T5 used a 4.900" diameter index. It is imperative that the bellhousing you obtain has the proper index diameter for the transmission or adapter kit you are planning to use.

The crank diameter on most Ford blocks accepts a pilot bushing which has an O.D. of 1.377"; and most Ford manual transmissions have a pilot tip of .670".

The three considerations mentioned above (engine dowels, bellhousing index & pilot bushing) are crucial components when starting an engine conversion.

Small block Fords had the option of utilizing two different flywheel diameters. These flywheels can be identified by a tooth count of 157 tooth or 164 tooth. It is critical that you match the flywheel diameter with the proper bellhousing and dust cover shield. For example: A bellhousing designed for a 164 tooth flywheel cannot use a 157 tooth flywheel. Since the starter bolts and indexes directly onto the stock bellhousing, the starter would not properly engage the incorrect flywheel. Therefore, make sure you verify the compatibility of these components.



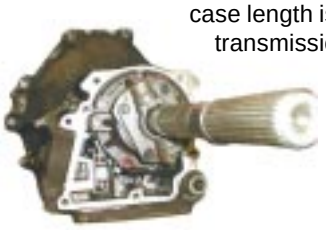
When obtaining your flywheel, you must also verify that the flywheel has the proper balance. 1982 & newer blocks used a different flywheel balancing weight than the earlier blocks. Some applications may require the flywheel to be rebalanced for the block.

When purchasing a Ford bellhousing, you should also consider your vehicle's stock clutch linkage. Shown on this page are the three different Ford bellhousings having different provisions for clutch linkages. Ford used various hydraulic and mechanical linkages. We recommend obtaining a bellhousing having a similar type linkage.

Transmission Information
(Automatics)

This section covers stock Ford transmissions, standard modifications, gear ratios, and bolt patterns. The general information provided will apply to most conversions in this book.

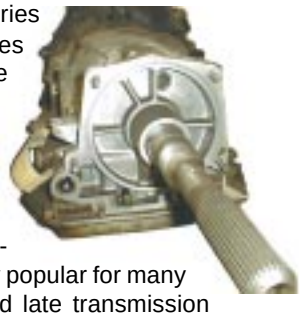
C4: This 3 speed transmission was used in Ford cars & trucks from 1964 to 1981. We recommend obtaining a 1970 & newer transmission for conversions. The transmission case length is 11.180", and with the bellhousing measures 17.00". This transmission was used up against small block Ford engines. The adapters we manufacture will normally require the installation of a new output shaft. This is the most popular transmission when converting to a Ford engine. The 1st gear ratio is 2.46:1; 2nd 1.46:1, and a 1:1 3rd gear ratio.



C5: This transmission was used from 1982 to 1986 in both the Rangers and F-series pickups. The case length and gear ratio is the same as the C4, except the oil pan on the C5 has a hump in it and the oil pan for the C4 is flat. The adapters that we manufacture for the C4 can also be used with this transmission.

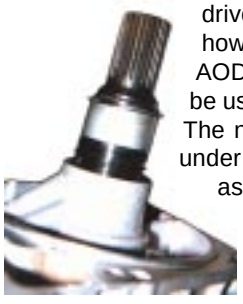
C6: The C6 is a Ford Heavy Duty 3 speed automatic. The gear ratio is the same as the C4 transmission. The C6 has a case length of 20", which includes the bellhousing. This transmission is used up to all three Ford block bolt patterns. The bellhousing and case are integral (one piece); therefore, the C6 has 3 different casings. This transmission was used in vehicles 1968 to 1979.

AOD: This Ford automatic overdrive 4 speed is drastically different in appearance than any of the C-series transmissions. This integral (one piece) transmission was introduced in 1980, and found in the F-series pickups behind small blocks. The transfer case adapters we manufacture for this transmission require the installation of a new output shaft. The AOD was used in cars and trucks up until 1993.



The 1980-87 (early) transmission main shaft was different than the 1988 & up (late) transmission main shaft. These shafts use different oiling holes and, if interchanged, could cause improper shifting or transmission damage. This transmission is becoming very popular for many conversions. We offer adapters for most early and late transmission applications. The transmission O.A.L. is 20.50" long. It has a 1st gear ratio of 2.40:1; 2nd 1.47:1; 3rd 1:1, and the 4th gear is a 33% overdrive.

AODE (4R70W): This transmission is similar to the above AOD transmission and was used in rear wheel drive vehicles starting in 1991. The adapter housing for the AOD transmission will fit the AODE; however, the output shaft of the AODE is different with reference to the oiling holes. Since the AODE does not have a governor, the oil supply line must be pugged. Our kits for the AOD can be used on the AODE transmission provided that you obtain a few components from Ford. The necessary components are approximately $29.00. The Ford components are sold under our part number **716057**. If purchased through a Ford dealership, the numbers are as follows:



Ford # 391-231S	Plug Pin
Ford # F2VY7B176-A	Sleeve to keep the pin in the shaft
Ford # 388104-S2	Governor snap ring to hold the sleeve on

E4ODE: This Ford automatic was used only in trucks from 1989 to current models. In 1999, the name of this transmission was changed to 4R100. We currently do not offer any adapters for this transmission.

*Ford emblem is a registered trademark of Ford Motor Company.

Transmission Information
(Manuals)

Ford manual transmissions can be classified into two groups. They are either Car or Truck style transmissions. The car-style transmissions used in Ford vehicles usually have a higher 1st gear. They are considered light duty compared to a truck tranny, but built strong enough to handle V8 horsepower. The truck-style transmissions normally have a lower 1st gear (non-synchronized). These transmissions are built to withstand the extreme 4WD conditions.

T18 (Truck-style): This transmission, found in 1965 to 1985 Ford pickups, is identified by a case length of 11.875". The 1st gear ratio is 6.32:1; 2nd 3.09:1; 3rd 1.69:1, and a 1:1 4th gear ratio. The adapters we manufacture for this transmission come with a new main shaft. This will usually allow the overall length of this transmission to remain ideal for most short wheel base vehicles. Ford was not the only manufacturer who used the T18 transmission. When searching for a T18 in salvage yards, make sure the bellhousing bolt pattern has a dimension of approximately 8-1/2" across the top, and 6-1/4" top-to-bottom. The input shaft stickout should be approximately 6-1/2". It is easier to adapt to the Ford T18 than to the Jeep or Scout T18.

T19 (Truck-style): This transmission looks identical to the Ford T18, and the case length is the same. The 1st gear ratio is 5.11:1 1st; 2nd 3.03:1; 3rd 1.79:1, and 1:1 4th gear ratio. These transmissions were used in Ford pickups 1974-88. The first gear on this transmission is synchronized, which is the biggest advantage over the T18. The adapter kits we manufacture for this transmission require a new main shaft. This shaft looks identical to the Ford T18, except it has a snap ring groove for the 1st gear synchronizer.

NP435 (Ford truck-style): We manufacture many adapters for the Ford version of the NP435. These adapters do not work on the Chevy or Dodge NP435. This transmission has a case length of 10.875". The 1st gear ratio is 6.69:1; 2nd 3.34:1; 3rd 1.66:1, and a 1:1 4th gear ratio. This transmission was used in Ford pickups from 1969 to 1979. It is easily identified by an aluminum shift cover. This transmission is available with two front input shaft lengths. The 6-1/2" input shaft stickout length is the ideal version to look for.

T & C 4 Speed: This transmission is mainly found in cars from 1967 to 1982. The case length is 10-1/4". The 1st gear ratio is 2.78:1; 2nd 2.92:1; 3rd 1.35:1, and a 1:1 4th gear ratio. This transmission is popular for both the early Broncos & Jeeps. The shifting mechanism is external. Shifter brackets and a shifter rod kit are normally required. This transmission is sometimes referred to as a T & C or 10 bolt top cover.

T & C 4 Speed O.D.: This transmission is used in both car and truck applications. The case length on this transmission is 10-1/4". The 1st gear ratio is 3.29:1; 2nd 1.84:1; 3rd 1:1, with an 20% overdrive. Ford used this transmission from 1978 to 1989. When used in a car application, this transmission resembled the standard T & C 4 speed. The shifting mechanism is external, and a shifter bracket and rods will be required. When used in a truck application, this transmission used a larger rear output shaft bearing and was top shifted. The kits we offer require the installation of a new main output shaft. We manufacture most of our kits to fit both the truck and car transmissions.

WC T5: The T5 transmission was used in Ford Mustangs from 1985 to 1995, and the Camaro & Firebird from 1989 to mid-1990s. These transmissions were designed to handle the horsepower of small block engines. When purchasing a T5, be aware that both Ford & Chevy used two different input shaft lengths. Therefore, it is imperative that the stock bellhousing be used for proper pilot bushing / clutch engagement. The Ford T5 also used various input shaft pilot tip diameters. You must verify that you have the correct pilot bushing for your transmission. In addition, the bellhousing has a slight rotation on the transmission bolt pattern. This can cause problems with the transmission crossmember. The Mustang T5 bellhousing was designed around a pull style, mechanical-type clutch linkage. When using this bellhousing on a vehicle with a hydraulic clutch linkage, you will be required to fabricate a slave cylinder bracket. When using this bellhousing on a vehicle with an mechanical clutch linkage, a linkage bracket must also be fabricated. The problem on a mechanical linkage is that most 4WD Fords used a push style linkage, and the T5 bellhousing has a pull style linkage. The bracket required for this bellhousing could be quite intricate.

2wd & 4wd Ford Bronco II, Ranger Trucks & Explorer

Ford V8 engine conversions into Bronco IIs, Ranger pickups & Explorers have become very popular. Since we have pioneered conversions for these vehicles for well over 15 years, we've strived to research every possible problem or difficulty you might encounter when converting your vehicle.

The parts we manufacture are available for small block Ford V8s retrofitting stock engines, while keeping the stock transmission or installing a new transmission. Because of the diversity of applications, we do *not* offer complete conversion packages. We have grouped the conversion components by application. Many of our components are necessary when converting your engine and/or transmission. Items such as exhaust and radiators can be modified or sourced elsewhere.

GENERAL CONVERSION INFORMATION:

The Rangers & Bronco IIs were first introduced in 1983, and come stock with either a 2.8 V6 or 4 cylinder. They later came equipped with a 2.9L, 3.0L or 4.0L V6 engine. Ford used various transmissions. The manual transmissions consisted of the Toyo Koygo, Mitsubishi or Mazda. These transmissions are all light-duty 4 & 5 speeds. The automatics that Ford used were the C3, C5 and A4LD. The conversion components we manufacture fit all Bronco II & Rangers. Currently, engine conversions using our components have been performed on Ranger pickups as new as 1997. Vehicles 1998 & newer had frame rail and suspension changes in which our components *do not* fit.

In 1991, the Ford Explorer was introduced, retiring the Bronco II models. This vehicle came stock with a 4.0L V6, and the A4LD transmission. The adapters we manufacture fit Explorers 1991-94.

Many questions arise when considering any engine swap and/or transmission swap. Some of these questions include what year & size block to use, transmission choice, transfer case & axle strength, suspension requirements, body lift, cooling, exhaust, etc. We've tried to address as many of these questions as possible.

TOOLS REQUIRED:

These vehicles utilize most metric fasteners. The engine is from Germany and the transmission is from Japan. Therefore, it is suggested that before you begin your conversion you should obtain the proper metric wrenches to ease the removal and installation of your new engine and transmission. In addition to these tools, you will need an engine hoist and torque wrench, and the capability to drill 1/2" diameter holes. These conversions can be accomplished without welding or cutting; however, in some cases modifications may be required. We recommend that the individual Ford shop manuals be obtained for torquing and electronic wiring specifications.

ENGINE SELECTIONS:

First check your local Department of Motor Vehicles for smog & engine requirements. Certain states (such as California) require the same year or newer engine as the vehicle. The engine should be complete, retaining all smog equipment. The most recommended engine is the Ford 302. If your engine choice is a 351 Windsor, extra consideration should be given regarding exhaust clearance. A special oil pan must also be purchased.

Ford 289 V8 Engines	Seldom used
Ford 302 V8 Engines	Most popular
Ford 351W V8 Engines	Difficult (oil pan & exhaust problems must be considered)
Ford 360, 390, 351M & 400	Not available
Ford 429 or 460 Engines	Not available

ENGINE & TRANSMISSION REMOVAL STEPS:

To remove the engine, take off the hood, drain the cooling system and depressurize the A/C system. Next, disconnect all necessary electrical connections and remove the fan shroud, radiator, and fan. Make sure that you label all of the electrical connections to ensure proper identification for the new engine. The next step is to remove the heater hoses, air cleaner, vacuum hoses, throttle cable, and the upper "Y" pipe bolts. It is advised that you label all of your vacuum hoses so that they can be reattached in the correct location. Now, remove the fuel lines and the transmission strut rods and, finally, the motor mount bolts. In some instances, it will be necessary to remove the A/C compressor and the power steering pump; however, in most applications this can be avoided. This procedure for removing the engine will take between two and six hours. The transmission should be removed prior to the removal of the engine.

STOCK TRANSMISSIONS:

On some Ford stock transmissions, we have listed a transmission identification code. This number is found on the driver's side door of your vehicle.

C5: The C5 was used in Ranger / Bronco II vehicles 1984-85. It has the same dimensions as the C4. If you have the C5, you simply need to change your bellhousing, torque converter, and valve body from a C5 V8 application. This is to prevent having to bother with the computer module. Failure to change these parts will cause the torque converter to lock up. Some customers have told us that it is cheaper to obtain a C4 transmission and install the C5 tailhousing & output shaft into the C4. Either one of these options work well. The original shift column linkage can be retained with some slight modifications.

C3: The C3 is identified by a "V" transmission code. The overall length of this transmission is 24". *We do not offer any adapters to retain this transmission.* If your vehicle has this transmission, you will need to select one of the Ford transmissions that we offer transfer case adapters for.

A4LD: The A4LD is identified by a "T" transmission code. The overall length of this transmission is 28.687". *We do not offer any adapters to retain this transmission.* If your vehicle has this transmission, you will need to select one of the Ford transmissions that we offer transfer case adapters for.

The following transmissions are all stock 4 & 5 speeds that Bronco II and Ranger vehicles might have been equipped with. These transmissions are considered light-duty. We offer an adapter plate to fit most of these transmissions to a standard Ford bellhousing. We've had customers experienced both good & bad results when retaining the stock manual transmission. Some considerations, with regard to engine size, tire size, and driving habits should be addressed when retaining these stock manual transmissions.

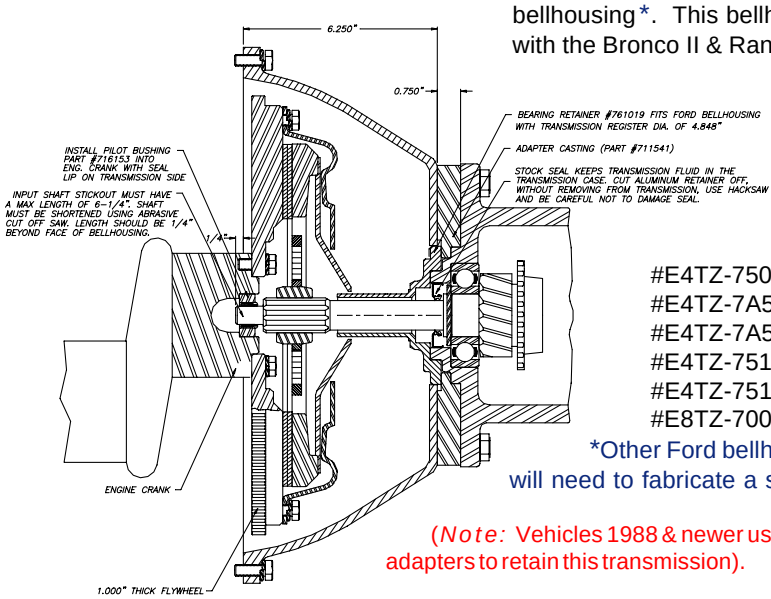
Toyo Koygo 4 speed: Transmission code "X", with an O.A.L. of 24". We offer a bellhousing adapter to retain this transmission.
Toyo Koygo 5 speed: Transmission code "5", with an O.A.L. of 25.937". We offer a bellhousing adapter to retain this transmission.
Mitsubishi 5 speed: Transmission code "D", with an O.A.L. of 28.687". We offer adapters to retain this transmission.
Mazda 5 speed: This transmission can normally be found in late model vehicles 1988 & newer. The bellhousing and transmission are integral (one piece). *We do not offer any adapters to retain this transmission.*

The 4 & 5 speeds listed above (that we offer adapters for) will require the following components:

Adapter Plate:

The kit includes the adapter plate, bellhousing index retainer, pilot bushing & necessary hardware.

P/N 712541 - This adapter plate bolts to the front of the stock manual transmission. This allows a standard Ford V8 bellhousing to be mounted to your stock transmission. When using the original transmission, it is best to obtain a late model (1984-87) F150 bellhousing*. This bellhousing utilizes an external slave cylinder that works well with the Bronco II & Ranger master cylinder. This bellhousing was only used with the 164 tooth flywheel. This will cause problems with tunnel clearance, so a body lift is normally recommended. The 4 or 5 speed transmission will need slight modifications to the input shaft pilot tip, clutch splines, and stock release bearing retainer. These modifications are noted on the instruction sheet provided in this kit.


6.250"
0.750"
BEARING RETAINER #761019 FITS FORD BELLHOUSING WITH TRANSMISSION REGISTER DIA. OF 4.848"
ADAPTER CASTING (PART #711541)
STOCK SEAL KEEPS TRANSMISSION FLUID IN THE TRANSMISSION CASE. CUT ALUMINUM RETAINER OFF, WITHOUT REMOVING FROM TRANSMISSION. USE HACKSAW AND BE CAREFUL NOT TO DAMAGE SEAL.
INSTALL PILOT BUSHING PART #716153 INTO ENG. CRANK WITH SEAL LIP ON TRANSMISSION SIDE
INPUT SHAFT STICKOUT MUST HAVE A MAX LENGTH OF 6-1/4". SHAFT MUST BE SHORTENED USING ABRASIVE CUT OFF SAW. LENGTH SHOULD BE 1/4" BEYOND FACE OF BELLHOUSING.
1/4"
ENGINE CRANK
1.000" THICK FLYWHEEL

#E4TZ-7505C - F150 Bellhousing
#E4TZ-7A564A - Ford Slave Cylinder
#E4TZ-7A544A - Slave Cyl. Bracket
#E4TZ-7515C - Release Lever
#E4TZ-7513A - Dust Boot
#E8TZ-7007B - Bhsg. Cover Plate

*Other Ford bellhousings can be used, but you will need to fabricate a slave cylinder bracket.

(*Note:* Vehicles 1988 & newer used an integral bellhousing & transmission. We do not offer any adapters to retain this transmission).

Clutch Requirements:

These stock transmissions all utilize the same length & spline count on the input shaft. If you are using the F150 bellhousing, the following Centerforce clutch components work well on this application.

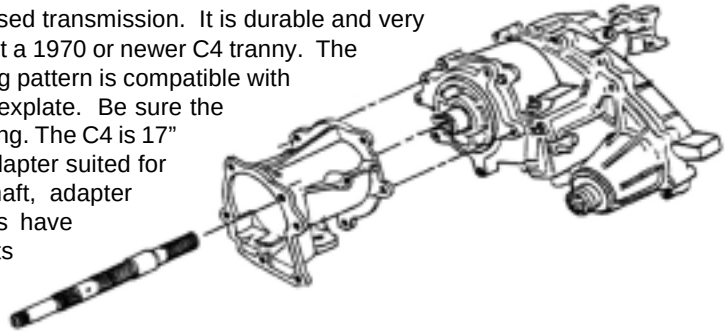
CF260000 - Centerforce 11" Pressure Plate (bolts to flywheel with 3 sets of 2 bolts)
CF360049 - Centerforce 11" Pressure Plate (bolts to flywheel with 6 evenly spaced bolts)
384070 - Centerforce 11" Clutch Disc 1" 23 spline (same as a Dodge disc)
N1714 - Clutch Release Bearing

TRANSMISSION UPGRADES WITH V8 ENGINES:

Since many of the stock automatic transmissions can not be retained, and some stock manual 4 & 5 speeds are marginal up against a V8, we manufacture several transmission-to-transfer case adapters. These adapters are designed around transmissions that were originally coupled to a Ford V8 engine, alleviating the need for a bellhousing adapter. Most of these adapters will allow you to retain your stock transfer case in its original location, thus eliminating the need for driveshaft modifications. These transmission upgrades kits are based around good, reliable Ford transmissions capable of handling V8 horsepower and torque.

Bronco IIs, Rangers & Explorers used three different transmission assembly lengths between the stock manual & automatic transmissions. Most of the adapters that we manufacture will give you 2 or 3 adapter options to directly replace your existing transmission. Some of the new transmission assembly lengths are not exactly the same overall length as stock, but the driveshaft and crossmember will normally compensate for this. We recommend that you measure your existing transmission assembly and compare this measurement to the adapters below. All of these adapter housings are drilled to utilize the factory rubber crossmember mount.

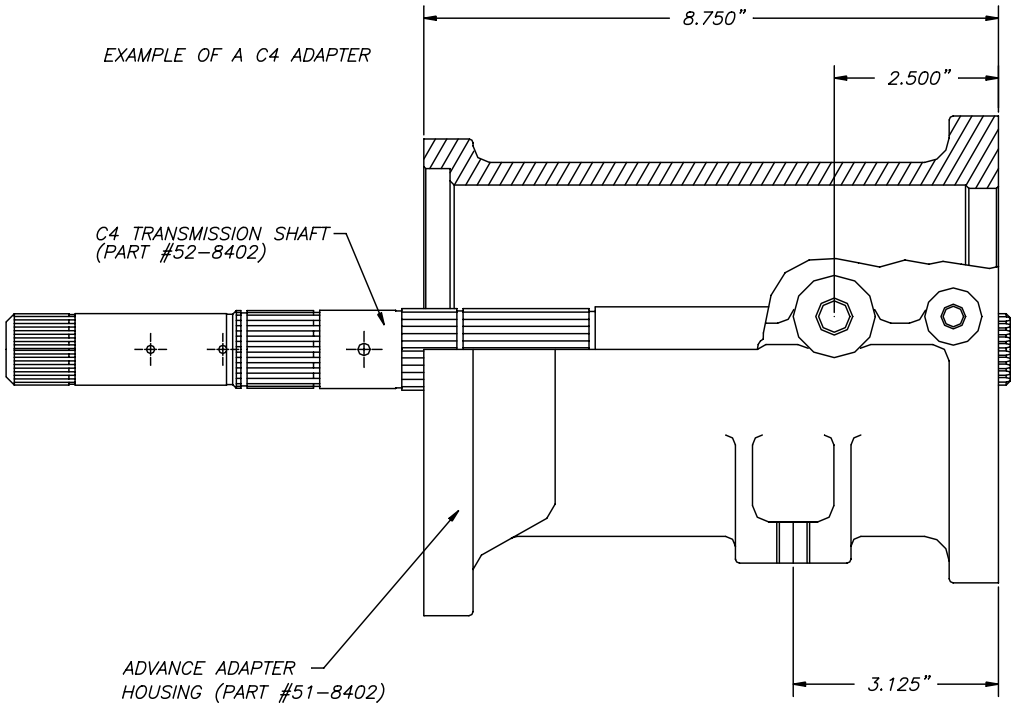
C4: The C4 automatic transmission is the most commonly used transmission. It is durable and very easy to find. Due to design changes, we advise that you select a 1970 or newer C4 tranny. The C4 has a removable bellhousing, so make sure the bellhousing pattern is compatible with the new engine and flexplate. We recommend a 157 tooth flexplate. Be sure the starter motor engages the flexplate correctly with the bellhousing. The C4 is 17" long. Combined with the new adapter length, use the best adapter suited for your application. Kits include a new 25 spline output shaft, adapter housing, vent cap & necessary hardware. These adapters have provisions to bolt the stock transfer case shifter bracket in its original location. The 1st gear ratio is 2.46:1; 2nd 1.46:1, and a 1:1 3rd gear ratio.



P/N 50-8400 - C4 to Borg Warner 1350 T/C. Adapter length of 6.812" (23.812" O.A.L.)

P/N 50-8401 - C4 to Borg Warner 1350 T/C. Adapter length of 11.5" (28.500" O.A.L.)

P/N 50-8402 - C4 to Borg Warner 1350 T/C. Adapter length of 8.75" (25.750" O.A.L.)



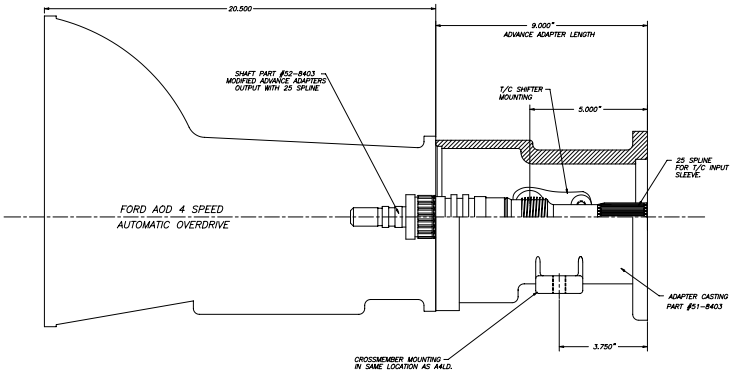
AOD: In 1980, Ford introduced the AOD (automatic overdrive) transmission. Most customers, whose vehicles were equipped with a stock overdrive transmission, wish to retain their overdrive capability for fuel economy. For this reason, this transmission has become very popular. The kits we manufacture are for both the early and late version AOD transmission. The AOD is 20-1/2" long. Combined with the new adapter length, use the best adapter suited for your application. This kit consist of a new 25 spline AOD output shaft, adapter housing & necessary hardware. The casting has provisions for bolting the stock transfer case shift linkage. Some modifications on this linkage may be necessary for casting clearance.

The 1980-87 (early) transmission main shaft was different than the 1988 & up (late) transmission main shaft. These shafts use different oiling holes and, if interchanged, could cause improper shifting or transmission damage. This transmission has a 1st gear ratio of 2.40:1; 2nd 1.47:1; 3rd 1:1, and the 4th gear is a 33% overdrive.

AODE (4R70W): This transmission is similar to the above AOD transmission and was used in rear wheel drive vehicles starting in 1991. The adapter housing for the AOD transmission will fit the AODE; however, the output shaft of the AODE is different with reference to the oiling holes. Since the AODE does not have a governor, the oil supply line must be pugged. Our kits for the AOD can be used on the AODE transmission provided that you obtain a few components from Ford. The necessary components, on average, are approximately $25.00. The Ford components are as follows:

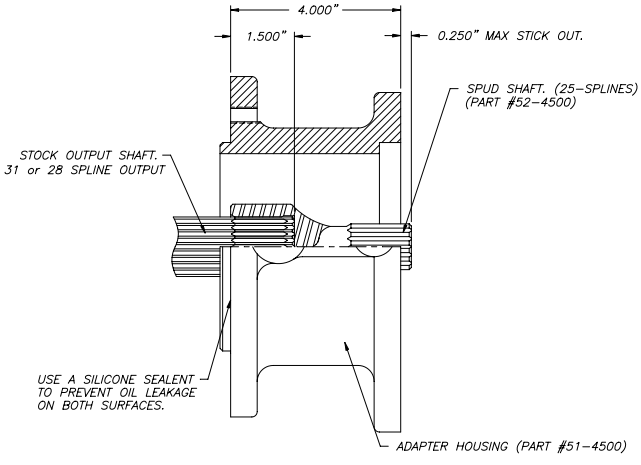
Ford # 391-231S	Plug Pin
Ford # F2VY7B176-A	Sleeve to keep the pin in the shaft
Ford # 388104-S2	Governor snap ring to hold the sleeve on

P/N 50-8403 - AOD (up to 1987) to Borg Warner 1350 T/C. (Adapter length of 9")
P/N 50-8404 - AOD (1988 & up) to Borg Warner 1350 T/C. (Adapter length of 9")
P/N 50-8405 - AOD (1988 & up) to Borg Warner 1350 T/C. (Adapter length of 5")



AOD transmission with
50-8403 adapter

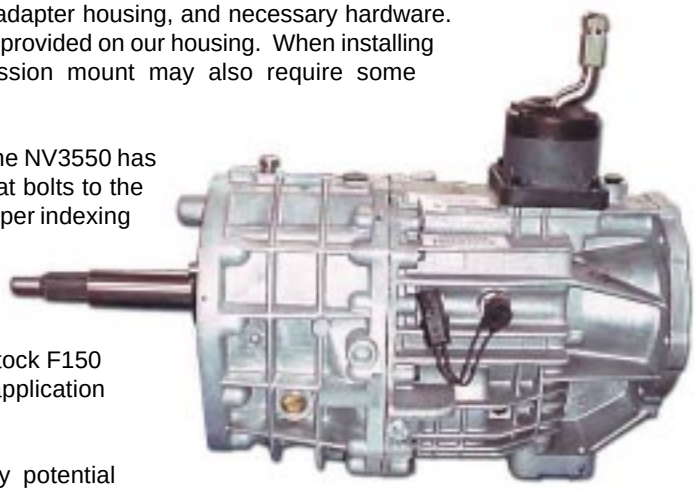
Full Size Ford 4WD transmissions: Ford full size 4WD trucks always used the same configuration on the stock transfer case adapter. Whether the stock transfer case was a NP205, NP203, NP208 or Borg Warner 1356, the back end of the stock transmission with the stock adapter housing always looked the same. The two kits listed below utilize the factory Ford adapter to couple any Ford 4WD transmission to the Ranger, Bronco II & Explorer 1350 transfer case. These Ford transmissions had either a 28 or 31 spline output shaft. Due to the various Ford transmission lengths, driveshaft and crossmember modifications are normally required. These kits include a spud shaft that couples the stock transmission output shaft to the 25 spline transfer case, the adapter housing, and the necessary hardware. The castings have provisions for the stock transfer case linkage. Modifications will be necessary on this linkage for proper fit.



P/N 50-4501 - Ford 4WD transmission 28 spline to Borg Warner 1350 T/C. Adapter length of 4".

P/N 50-4502 - Ford 4WD transmission 31 spline to Borg Warner 1350 T/C. Adapter length of 4".

NV3550 5 speed: The NV3550 transmission is a new optional transmission for swapping into the Rangers, Bronco IIs, and Explorers. This 5 speed is rated at 300 ft./lbs. at 7200 GVW. The weight of this 5 speed is 97 lbs. The gearing of this 5 speed is as follows: 1st 4.01:1; 2nd 2.32:1; 3rd 1.40:1; 4th 1.00:1; 5th 0.78:1, and Reverse 3.57:1. This transmission is 16-3/4" long. When coupled to our 4-1/2" transfer case adapter and a 7-7/8" bellhousing, this transmission package has an O.A.L. of 28-5/8". The transfer case adapter included is a spud shaft to couple the NV3550 23 spline output shaft to the 25 spline transfer case, a custom adapter housing, and necessary hardware. Provisions for your stock transfer case shifter linkage have been provided on our housing. When installing this linkage, modifications are required. The rear transmission mount may also require some modifications.



The stock Ford 302 bellhousing will also need to be adapted. The NV3550 has a 7-1/2" long input shaft. We manufacture an adapter plate that bolts to the front of this transmission. This adapter provides you with the proper indexing and bolt pattern to couple to the stock Ford 302 bellhousing. The bellhousing will require some slight modifications. Another consideration is the clutch disc spline. The Ford is 1-1/16" 10 spline, and the NV3550 is 1-1/8" 10 spline; therefore, a new disc is included in the adapter plate kit. The stock F150 bellhousing listed on **Page 10** would be the best suited for this application since it does provide the correct hydraulic mechanism.

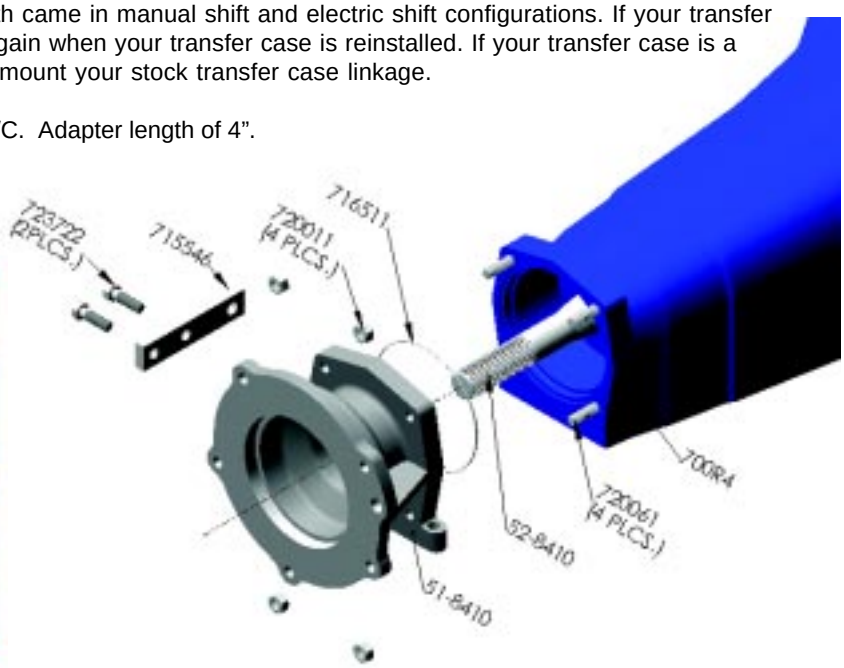
At the time of printing this manual, we are unaware of any potential assembly issues. This transmission package was primarily created because of the T5 availability issues.

P/N 50-1802A - NV3550 to Borg Warner 1350 T/C. Adapter length of 4-1/2".
P/N 712544 - NV3550 to Ford bellhousing 4.848" index (adapter length 7/8")
P/N 26-3550- NV3550 transmission

700R TRANSMISSION RETRO FIT WITH STOCK 4.0L ENGINES:

Transfer Case Adapter: The General Motors 700R-4 has a case length of 23-3/8", and is available in three different engine-to-transmission bolt patterns. The case is available with a Chevy bolt pattern that has the top two holes 8-1/4" apart, a Buick bolt pattern that has the top two holes 7" apart, and a 2.8L Chevy bolt pattern that has the top two holes 5-1/8" apart. The rear side of the transmission case has a square bolt pattern that uses 4 bolts. There are several various lengths of output shafts that GM used; however, the stock output shaft will be replaced with a new 25 spline output shaft which is provided in our kit. This adapter can be used in either Ford Rangers or Explorers. The adapter is 4" thick, and when used with our P/N 712592 (4.0L to 700R4 bellhousing adapter), no driveshaft modifications should be needed. The adapter has a crossmember foot that mimics your stock A4LD tailhousing.
The Borg Warner 1350 & 1354 transfer cases both came in manual shift and electric shift configurations. If your transfer case is an electric shift type, just plug it back in again when your transfer case is reinstalled. If your transfer case is a manual shift type, this kit includes a bracket to remount your stock transfer case linkage.

P/N 50-8410 - 700R to Borg Warner T/C. Adapter length of 4".



Bellhousing Adapter: The General Motors 700R-4 transmission that this kit is designed for, is the small 60 degree 2.8L bolt pattern that has the top two holes 5-1/8" apart. This kit was designed in conjunction with P/N 50-8410 to replace the automatic transmission in 4WD Ford Explorers and Rangers with the 4.0L engine. *This kit will also work with vehicles that had a manual transmission behind the 4.0L engine. When using this kit in conjunction with P/N 50-8410, no driveshaft modifications should be necessary. (*Replacing a manual transmission would require the purchase of an O.E. flexplate and spacer.)

Part No. 712592 comes with the bellhousing adapter plate, torque converter adapter ring, necessary hardware, and the instructions to wire the neutral safety switch and perform the necessary vehicle modifications. The exhaust requires some modifications, and you will be required to install a torque converter lockup kit and a TV kickdown cable. The TV cable and bracket for this application are available from Bowtie Overdrive (Tel# 760-947-5240).

P/N 712592- 60 degree 700R to Ford 4.0L V6 engine

700R Installation Notes: The Ford Rangers and Explorers with the 4.0L engine are good reliable vehicles. Over the years about the only complaint we've heard was about the transmission. The A4LD transmission seems to be okay for the stock vehicle applications; however, larger tires, engine performance upgrades, and gear ratio changes exceeds this transmission's capability.

Our first look into any type transmission retrofit took us toward a Ford AOD. The biggest problem this transmission was the bellhousing diameter difference from that of the 4.0L engine. We then looked towards a possible manual transmission option which included a T5 and a NV3550. The T5 was scratched due to lack of stock components and the NV3550 ended up having the same problem as the Ford AOD transmission. After a few other transmissions considerations, the 700R seemed to be about the only transmission option left. Knowing that some people are brand loyal, we were a bit leery of adapting a GM transmission in a Ford; however, the 700R has a good, reliable reputation. It offers a 3.06:1 1st gear and provides a 30% overdrive. The most important thing is that the size of the 60 degree 700R closely matches the bellhousing size of the A4LD.

By using the transfer case adapter on the previous page along with the bellhousing adapter list above, the 700R transmission can be installed into you vehicle. Listed below are some additional components and modifications required when doing this swap. This is a summary of what you may experience. The instruction sheets in our adapter kits will give you a better, detailed installation.

The A4LD transmission is a column shifted unit, the installation of a 700R transmission will require the use of a floor mounted shifter. We installed a Lokar shifter **P/N 23-R700** onto the floorboard. You can use a different brand shifter like the B&M listed below; however, clearance may be an issue with the throw of the shift handle or the size of the console.

The transmission cooler lines were changed out to a new flexible style for ease of assembly. If the stock lines are retained, you will need to change the fittings and reroute them to couple up to the GM transmission. The flex hoses, **P/N 23-1500**, fit the GM 700R and may require additional fittings to couple to the Ford radiator. We also recommend the Lokar flexible dipstick, **P/N 23-0002**.

The 700R requires a torque converter lockup kit. Most transmission shops such as Bowtie Overdrives can assist you with this. The instruction sheet for the bellhousing kit provides a wiring diagram for the connection of the neutral safety switch.

The exhaust system requires some modifications. The exhaust Y-pipe must be cut in the middle of the center straight section, as seen in the picture (right). The bellhousing kit includes a piece of tubing to reconnect the exhaust system.

AUTOMATIC TRANSMISSION DIPSTICK:

The automatic transmission dipstick will usually have limited clearance when doing a transmission swap. Whether it is the heater or air conditioner plenum, the stock dipstick tube will usually interfere. If you try modifying the stock tube, nine times out of ten you will end up kinking the dipstick tube. We recommend using a flexible transmission dipstick from Lokar Performance, **AA P/N 23-0003 Ford C4** & **P/N 23-0002 GM 700R**.

AUTOMATIC TRANSMISSION SHIFTER:

If you are upgrading to a new automatic transmission, a new shifter would need to be considered. We recommend using a cable-operated floor shifter. This type of shifter allows you to mount the shifter body in your ideal location. There are many manufacturers of cable-operated floor shifters. The main consideration is that it works with your transmission. We offer a B&M sports shifter that fits both the C4 & AOD transmissions. This console mounted unit works well in these vehicles. **P/N 715680**.

TRANSFER CASE:

The Bronco II, Ranger & Explorer vehicles use a Borg Warner 1350 style transfer case. The transfer case has a 25 spline input sleeve, thus requiring a transmission to have a 25 spline output shaft. When bolting a transmission up to this transfer case, the output shaft of the transmission assembly should extend approximately 3/16" beyond the face of the transmission adapter housing. This transfer case has been manufactured in both a manual shift and an electric shift style. The adapters we offer are compatible with both styles transfer case shifter linkages. We provide the necessary mounting holes in relatively the same location on all of our adapters. In some cases, slight modifications to the mounting brackets and/or shifter handles are required. Most conversions are designed so that relocation of the transfer case can be avoided. On most adapters, the stock crossmember will normally fit in its original location. When bolting the transfer case to our adapter, we recommend using RTV Blue silicon to seal these components together to prevent leakage.

The chain-driven Borg Warner 1350 transfer case is normally strong enough to handle the torque of a V8 engine. The low gear ratio of this transfer case is 2.48:1. Customers wishing to upgrade this transfer case to one of our *ATLAS* gear-driven transfer cases now have this option. The Atlas is available in either a *2.0:1*, *3.0:1*, *3.8:1*, *4.3:1*, *5.0:1*, and a *6.0:1* gear ratio. The unit is shifted by a universal dual handle mechanism, **P/N 303006L**, that fits well in most vehicles. For more details on the Atlas, see **Page 21**.

DRIVESHAFTS:

On **4WD** conversions, we have designed most transfer case adapters in two-to-three various adapter lengths. By selecting the correct adapter length the new transmission assembly can, in most cases, directly interchange with the original automatic or manual transmission. This will eliminate any modifications to the transfer case location, crossmember mount, shifter linkage or driveshafts.

On **2WD** conversions, you will have the option of using any transmission originally hooked to a V8 engine. The output shaft on 2WD V8 transmissions are normally 28 splines - the exact same splines as on your original Bronco II, Ranger & Explorer 2WD transmission. As a general rule, the back of the new V8 engine is located exactly in the same position as the back of the original V6 or 4 cylinder engine. If you obtain a 2WD transmission approximately the same length as the original transmission, then you will not have to modify your drivelines. In other words, if your 5 speed transmission is 26-1/2", and you select a C4 automatic that is 26-1/4", you will not require any driveline modifications. On some applications, the transmission side of the driveshaft may have to have the yoke changed.

2WD CROSSMEMBER:

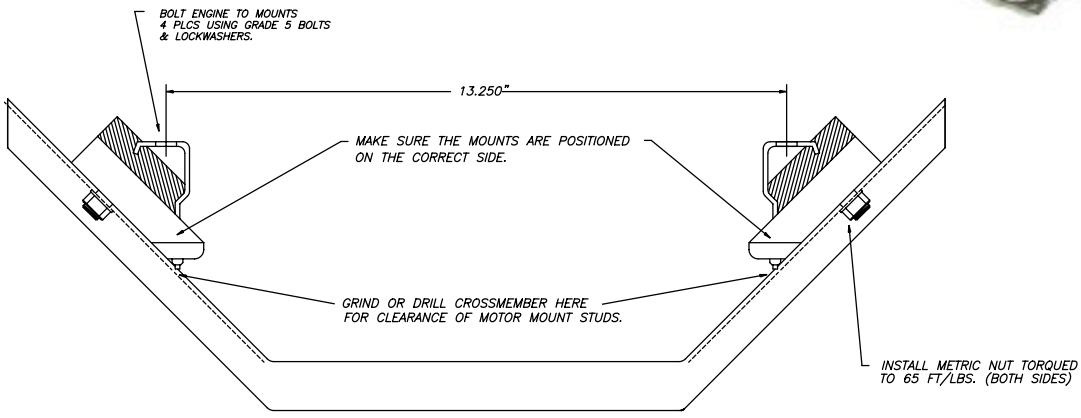
On 2WD applications, the stock crossmember will remain the same. Some vehicle applications will require the crossmember to be relocated further back to couple to the new transmission mounting pad. We have had customers move their entire crossmember back, while others fabricated a bracket to offset the rubber mount to meet the new transmission pad.

AXLE STRENGTH:

Your vehicle is equipped with one of three different rear axles Ford used. Up to 1984, Ford used a 6.75 rear axle. This axle is marginal up against a V8. Vehicles 1985 to 1989 used a 7.5 rear end, and vehicles 1990 & newer used a 8.8 rear end. These axles are usually sufficient to handle the power of a V8. Something to consider is tire size. If a large tire size is going to be used and the V8 is a high horsepower application, you might consider having a custom rear end built.

4WD ENGINE MOUNTS:

On *4WD* vehicles, the original 4 cylinder and V6 engines are supported by a large metal crossmember that provides the necessary engine mount positions. When converting to the new V8 engine, you will eliminate the original engine mounting pads. You will be required to drill two new 1/2" holes in your crossmember and do a bit of grinding. The instruction sheet for these mounts provides measurements for the new hole locations. Our 4WD engine mounts, **Part No. 713018**, are a direct connection between the new V8 engine and the existing crossmember. They will position the engine so that no additional oil pan modifications will be required when using the regular Ford dual sump pan.


BOLT ENGINE TO MOUNTS
4 PLCS USING GRADE 5 BOLTS
& LOCKWASHERS.
13.250"
MAKE SURE THE MOUNTS ARE POSITIONED
ON THE CORRECT SIDE.
GRIND OR DRILL CROSSMEMBER HERE
FOR CLEARANCE OF MOTOR MOUNT STUDS.
INSTALL METRIC NUT TORQUED
TO 65 FT/LBS. (BOTH SIDES)

2WD ENGINE MOUNTS:

On *2WD* vehicles, the original 4 cylinder and V6 engines are supported by a large metal crossmember that provides the necessary engine mount positions. These mounts are designed to fit both body styles of the Ford Ranger 2WD pickups. The mounts are slotted to have some adjustment to the engine position once installed. On the early body style Ranger, the driver's side mount will require a hole to be drilled in the cradle. Accounting for just a couple of differences, the installation of these mounts into both the early and late model Rangers are basically the same.

Rangers 1992 & earlier require a 1/2" hole to be drilled into the stock engine cradle for the installation of our mounts. It also requires the fuel filter to be relocated. The fuel filter is located inside the driver's side frame rail. The fuel filter must be relocated to allow for proper exhaust clearance.

On both body styles of the Rangers, we recommend doing a "dry run" on the engine installation. The mounts should be installed loosely into the Ranger engine cradle. Lower the block into position on top of the new mounts and adjust the block to the furthest forward location allowed by the slots in the mounts. Adjust the block so that it sets level from side-to-side. This first trial run will allow you to mark the air box on the passenger side of the vehicle for proper clearance. The driver's side firewall will also require a slight amount of clearance (a small dent in the firewall to obtain valve cover and head clearance). Remove the engine and perform the necessary modifications to the air box and the firewall. Our engine mounts are **Part No. 713015A**. The Ford V8 engine rubbers mounts are Part No. E4TZ-6038G, or **AA Part No. 713017**.

P/N 713015A

P/N 713017

WATER PUMP:

There are two different belt systems used on Ford V8s; either a “V” belt or a Serpentine. The water pumps must have the fluid exit on the driver’s side if you are planning to use our radiator. Most water pumps have this configuration. The Serpentine pumps are a reverse rotation water pump. The stock belt system must be retained on this water pump. Either pump can be used with a new engine swap; however, we have found that you can obtain more engine clearance with the “V” belt system.

On vehicles requiring additional water pump clearance, Ford Motor Sport offers a short version “V” belt & Serpentine water pump. The “V” belt water pump, Part No. M-8501-E351, is 1.5” shorter than stock. This water pump requires an aluminum 3-piece pulley, Part No. M-8509-P (2 grove). The Serpentine water pump is Part No. M-8501-A50. This water pump is 1.750” shorter than stock and requires one of the following aluminum pulleys: M-8509-L (steel) or M-8509-M (aluminum). The kit includes the pulley for the water pump, a crankshaft & alternator. These pumps are not legal on pollution-controlled vehicles. Ford Motor Sport can be reached at Tel# (810)468-1356.

RADIATOR MODIFICATIONS:

Your vehicle is equipped with a standard 2 core radiator. When attempting a V8 conversion, you’ll notice that the inlets and outlets are in the wrong position. It’s possible to modify your existing radiator by switching the tanks and relocating the inlet and outlet; however, we have found that, in most instances, this still does not provide adequate cooling for even the mildest V8 engine. We have had a few customers try a Ford Explorer V8 radiator, but have never heard any feed back on how it worked.

We recommend that you consider one of two options. We manufacture a 4 core copper/brass radiator to help prevent any cooling problems. This radiator comes complete with hoses and remote filler neck. We also have our Rad-A-Kool aluminum 2 core radiator (with transmission cooler). Both of these radiators can be installed while retaining the air conditioning condenser in the stock location; however, for the best fan clearance, the condenser can be moved forward and the radiator tucked under the grille. You will also need to use a new A/C condenser. We recommend a Universal condenser that is 5/8" thick. Both radiators fit 2WD and 4WD vehicles. Both radiators measure 16” H x 21.5” W x 3” D.

P/N 716683 - 4 Core Radiator *(This radiator is not intended to be use with the original 2.9 V6 engine)*

P/N 716696-AA - *Rad-A-Kool* 2 Core Aluminum Radiator (w/ transmission cooler)

AIR CONDITIONING:

If your Bronco II, Ranger or Explorer is equipped with air conditioning, the air conditioning condenser will have to be relocated in front of the radiator as far forward as possible. This will allow for additional fan clearance. The radiator support and grille may need to be modified for additional room. An aftermarket tubular grille is a handy way to free-up extra room in front of the radiator. The factory air conditioner compressor may be used; however, brackets to mount it onto the V8 will have to be fabricated. When using an injected 302 engine, the engine intake interferes with the A/C plenum. **Page 20** shows the A/C plenum installation clearance concerns.

The hose connections must be modified and the wiring extended to reach the new compressor location. A new 5/8” thick universal condenser from Modine can help make additional clearance. This optional A/C Condenser is Modine Model No. 1K500001.

FAN:

On most conversions, you will be able to retain a stock mechanical fan. We have been told that a fan off of a Ford Falcon works well. With your engine in the correct location, you will have a 1/2" to 1-1/2" of clearance between the fan and radiator. If a mechanic fan is used, a shroud should be fabricated to properly draw air through the radiator. This is also a safety precaution. We have encountered some vehicles with variations that require the use of an electric fan. If an electric fan is used, most V8 engines require a minimum of 950 CFM. We recommend using two 12" electric fans to provide adequate cooling. Most electric fans come complete with a fan shroud.

ALTERNATOR:

Your stock V6 alternator can be retained by using the correct V8 pulley, alternator bracket, and adjuster. If you are replacing a 4 cylinder engine, we recommend that you purchase a new V8 alternator to provide the correct amperage.

#E7TZ-10A313-B	Ford Alternator Mounting Bracket
#E6AZ-2888-A	Ford Alternator Adjusting Bracket

POWER STEERING:

You will be able to utilize your stock power steering pump by using the correct brackets. These brackets can be found on most Ford passenger cars from 1978-86. In addition to this, you will need to obtain the correct V8 pulley for proper belt alignment. The hoses can be retained in the original length on most conversions.

#E5AZ-3C511-A	Ford P/S Brackets
#E6SZ-3A674-B	Ford P/S Pump
#E1FZ-3A697-A	Ford P/S Reservoir

FUEL PUMP:

(Carbureted) - In most cases, a mechanical fuel pump will interfere with the steering box and frame rails. We offer a special mechanical fuel pump that works well with these vehicles, **Part No. 716052**. This fuel pump is manufactured with the diaphragm above the arm to allow additional clearance to the steering box. This fuel pump cannot be used on vehicles that are using the Serpentine belt with the air conditioning and power steering systems. If your vehicle was originally equipped with electronic fuel injection, you will have a fuel pump in your gas tank. This fuel pump has a 40 psi rating and will not work with a normal carbureted engine without the use of a regulator. This regulator must reduce the psi to between 5 and 7 pounds. If a regulator is not available, then you can also use an in-line fuel pump. If an in-line fuel pump is used, then the fuel pump in the fuel tank should be removed.

(Injected) - Since most injected blocks require a high pressure fuel line, the stock fuel pump (inside the fuel tank) is usually adequate.

P/N 12-803	Holley Fuel Regulator
P/N 716052 -	AA Fuel Pump

OIL FILTER BYPASS ADAPTER:

You will be required to use a remote oil filter adapter when attempting this conversion. This adapter is available from us under **Part No. 716084**. You cannot complete your conversion without this part. The kit comes complete with hoses, bypass adapter plate, and remote oil filter mounting bracket. The remote mounting bracket can be installed on the fender apron. This kit will provide the clearance on the steering sector and the chassis. This special remote adapter has the inlets at a 90 degree angle. Not all remote oil filter adapters can be used on these vehicles because the fittings normally protrude straight out off the block adapter. We have had several cases where customers purchased other bypass oil filter adapters only to find that the fitting locations are not compatible with the engine conversion installation. We only offer the block-off adapter and remote oil filter mounting plate as a kit. No items in this kit are sold separately. Advance Adapters uses the Perma-Cool brand name.

GAUGES:

When converting to a V8, you can use the stock V6 temperature and pressure gauge sending units. These units will be compatible with your new V8 engine and stock gauges. If your vehicle is equipped with a factory tachometer, you will need to have it re-calibrated for use with your new engine.

STARTER MOTOR:

The Ford V8 requires that the starter motor be bolted to the bellhousing. For this reason, it is imperative that you check your flywheel and starter for proper engagement *before* installing the engine into your vehicle. Ford bellhousings are normally matched to Ford flywheel diameters. (A bellhousing designed for 164 tooth flywheel cannot be used with a 157 tooth flywheel). The wrong flywheel will result in the inability to find a matching starter. For the most part, manual transmission conversions will use a 164 tooth flywheel, while automatic conversions will use a 157 tooth flexplate. The original Bronco II starter will not be retained.

OIL PAN:

There is a special dual sump oil pan required for all 2WD & 4WD V8 conversions. This pan is available from your local Ford dealer and must be ordered to match your particular year of engine. The oil pan must be purchased complete with a new pickup tube and screen for the V8 installation. This pan is a standard Ford part and is found on most 1980 & newer 302 motors. If your engine is an older style that has the dipstick entry into the side of the pan, then you will need to modify your new pan for use with your older engine. This will require some welding.

302 Ford Oil Pan Assembly Consists of: (**AA P/N 716412**)

#F1SZ-6675B	Ford Oil Pan
#E7PZ-6622A	Ford Pickup Tube

351 Ford Oil Pan Assembly Consists of:

#E7AZ-6675A	Ford Oil Pan
#D9AZ-6750B	Ford Dipstick
#D9AZ-6622B	Pickup Screen
#D9AZ-6754B	Dipstick Tube

CAUTION: When installing a new oil pan, dipstick, and pickup tube, you must make sure that you locate the pickup screen in a position that will provide ample supply of oil. Be sure and calibrate your new dipstick assembly.

FLYWHEEL & FLEXPLATE:

It is required that you use a 164 tooth flywheel for manual transmission conversions. In order to use the late model Ford F150 truck bellhousing on manual stock transmission installations, you must use the 164 tooth flywheel. This flywheel cannot be changed since the bellhousing requires the starter location in a position compatible with only the larger flywheel. On late model 302 blocks (1982 & newer), Ford did not offer a 164 tooth flywheel. An early year flywheel can be used, but the flywheel must be balanced to this block. This can be performed by most engine rebuilders.

For automatic transmission installations, we recommend that the 157 tooth flexplate be used in order to allow for additional clearances and minimize tunnel area modifications. *Use great caution in selecting the proper flexplate*. 1982 & newer late model engines will require a counter balance. Make sure to test fit your starter motor, bellhousing, and flywheel assembly before proceeding with the engine installation.

IGNITION SYSTEM:

Your Ford vehicle is equipped with an electronic ignition and computer control module. It is best advised to avoid using this system with your new motor. If you are going to retain a computer controlled engine, then we recommend obtaining the Ford schematics. The easiest installation for computerized V8 engine installations is to use the Street & Performance wiring harness or the Ford Motorsports wire harness. Ford Motorsports offers a wiring harness for the aftermarket engine conversion industry. This wiring harness is easy to install and is perfect for 4WD engine conversions and kit cars. There are many other manufacturers of Ford aftermarket wiring harnesses. We have found the Internet to be a good source in finding additional manufacturers other than the ones we have listed above.

EXHAUST/HEADERS:

4WD Vehicle Headers: The installation of a V8 engine can create exhaust clearance problems. On 4WD vehicles that are not retaining smog equipment, we offer exhaust headers that fit these close quarters, **P/N 717044**. This header is designed with 1-1/2" primary tubes that dump into a 2-1/2" secondary. The header system uses exhaust clamps to fasten to the new exhaust system to maximize clearance.

2WD Vehicle Headers: We manufacture a header to fit into 2WD Rangers. Part number **717044A** and **717044A-NP** are custom headers designed for our engine mounting system. When installing a V8 with our headers, the passenger side header is a tight fit. If the transmission you are using has the larger bellhousing to fit the 164 tooth flywheel, the bellhousing will require modifications for header clearance. We recommend that you set the passenger header alongside the frame rail before setting the engine into the engine compartment. The driver's side header can be installed once the engine is in the proper location. Once the engine is installed and leveled, bolt both headers to the block and check clearances. This header design is new to our product line. The headers will only fit with our new style 2WD mounts (713015A). At the time of printing this manual, we have not test fitted this header design with the 4WD mounts we offer. This header uses 1-1/2" primary tubes that exit out of the engine compartment into a 2-1/2" collector, the collector uses exhaust clamps to fasten to the new exhaust system to maximize clearance.

2WD & 4WD Stock Exhaust Manifolds: The headers listed above are not smog legal. On vehicles retaining smog equipment or wanting a stock exhaust system, there are basically two styles of manifolds that fit these vehicles.

The Ford Explorer manifolds fit well and provide the correct emission controls for smog in most vehicles. For vehicles not concerned about smog, the stock manifolds from a Ford Maverick, Comet, or '79 1/2 ton Ford truck work well. The photos below show one other stock cast iron Ford manifolds that also fit well; however, the vehicles that these stock Ford manifolds were off of is not known.

Note: The exhaust manifolds from a Mustang *will not* work. If a 351W block is used, exhaust manifolds, or our headers cause steering interference.

Early stock Ford manifolds.

Stock Ford Explorer V8 manifolds (1996 & newer) for most smog controlled vehicles.

SUSPENSION & BODY LIFTS:

Our kits do not require the use of a body lift; however, it is worth considering. A body lift will provide additional clearance to the heater box / air conditioner plenum, while at the same time provide more clearance around the bellhousing and usually eliminate any other type of clearance problems.

The installation of a V8 is about 175 lbs. heavier then the stock engine. On 2WD applications, the suspension will normally drop about 1 inch. We recommend using a heavy-duty shock that will compensate for this drop. On 4WD applications, the suspension is equipped to handle the extra weight. Once completing any one of these vehicles, the front alignment should be checked.

FIREWALL MODIFICATIONS

The firewall and floor pan area is narrow. This is where a body lift will aid in clearance. Minor modifications are normally needed. The following is a list of these modifications:

1. The body seam between the floor pan and the firewall will need to be bent over. In some instances, additional clearance may be needed in the bottom corners where the firewall meets the floor pan.

2. The heater box on the firewall needs to be trimmed and patched to clear the valve cover. This modification is approximately 5" x 7". We recommend that you pop-rivet & epoxy a new piece of sheet metal over the hole.

3. If you are using a fuel injected block, you will also run into interference with the air conditioning plenum on the engine air intake. On these installations, the plenum must be modified. (Photos 1 & 2)

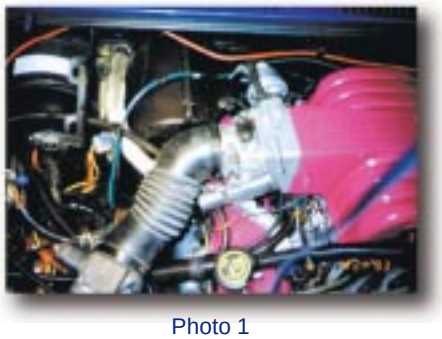


Photo 1

Photo 2

The photo above shows the driver's side firewall modifications.

The photo left and bottom shows the air duct modifications for valve cover clearance on the passenger side.

AVERAGE INSTALLATION HOURS:

The average conversion time on most vehicles is approximately 40-50 hours.

The Atlas Transfer Case

BRONCO II, RANGER & EXPLORERS

The Atlas has been designed to replace the stock Borg Warner 1350 transfer case. The Advance Adapters "Atlas" 2.0:1, 3.0:1, 3.8:1, 4.3:1, 5.0:1, and the 6.0:1 gear-driven transfer cases are the ultimate in gearing and strength. These units are the solution for combining both on and offroad performance. When you want or need peace of mind on the trail, on the rocks, in the sand, or in the mud, the Atlas is the transfer case for you.

RATIO OPTIONS: Since there are numerous transmission, engine, and axle combinations creating a number of low range ratios, the Atlas gear ratio options have been designed to accommodate any type of combination. The following descriptions of each low gear ratio are only suggestions. The trends seem to favor what we have listed below. Before selecting an Atlas for your vehicle, please consider your axle ratio, transmission ratio, and your driving habits.

3.8:1 Ultra Low: This unit works well in all applications. The Atlas 3.8 is a good choice for the avid 4-wheeler, since this low gear ratio is ideal for moderate to some extreme rock crawling. Most vehicles equipped with an automatic transmission rely on their braking capability in rugged terrain. This 3.8 low ratio works well with automatic transmissions.

4.3:1 Extreme Low & 5.0:1 Ultimate low: These unit are most popular for rugged terrain. They seem to be the ratios of choice when your vehicle is equipped with a manual transmission. These unit are commonly used in vehicles participating in rock crawl events.

3.0:1: This transfer case was developed for the customer that does the majority of 4-wheeling on rolling hills, sand, and mud. However, this unit can be used for rock crawling as well. This ratio is slightly lower than most stock transfer cases, allowing you to increase tire size without losing the needed gearing.

We also offer a 2.0:1 and a 6.0:1 low gearing option in the Atlas.

INSTALLATION CONSIDERATIONS

You should first consider clearance for the Atlas case. You will either be required to have a body lift (1" minimum), or else be prepared to do crossmember modifications and/or considerable underbody modifications.

You will be required to remove the stock breather hose bracket from the stock tailhousing, as it will interfere with the Atlas shifters.

When we performed the Atlas installation in an Explorer, we opted to use a 1" body lift which only required some floorboard modifications. When test fitting the Atlas into your vehicle, mark the areas that interfere with the Atlas. Clearance should be checked on the shifter housing, the shifter linkage rods, and the upper front portion of the case. Modify the body accordingly to acquire proper clearances.

The shifter assembly for these vehicles will require modifications to be done to your floorboard for shifter handle access. It is easiest to perform the installation by removing the driver's seat, along with pulling back the carpet to expose the tunnel area. With the Atlas bolted in position, install the twin stick extension tube and shifter base to locate the position best suited for clearance. Cut the floorboard to allow at least 1/2" clearance around the shifter handles in both 4WD high and 4WD low.

Your stock speedometer connection off of your Borg Warner transfer case is different than the Jeep speedometer housing that the Atlas uses. To connect your speedometer cable to the Atlas, you must first reroute the cable over the driver's side frame rail. A speedometer adapter must be purchased from *Nevada Speedometer*, Tel# (775)-358-7422. The speedometer adapter will couple the Atlas housing and connect it to your stock speedometer cable. This adapter also has a electrical connection that will interface with your stock wiring harness.

At the top of the Atlas you will find 90 degree brass elbow. You will need to attach a new vent tube hose (3/8" fuel hose). Route this hose along the transmission or frame rail, ending up at the upper portion of the firewall. Attach a free flowing atmospheric breather onto the end of this hose. This type of breather can be found in earlier model vehicles or on many differentials. It also prevents the Atlas from building up pressure and blowing oil out this breather. We offer these parts under **P/N X11320**.

1966-77 Ford Broncos

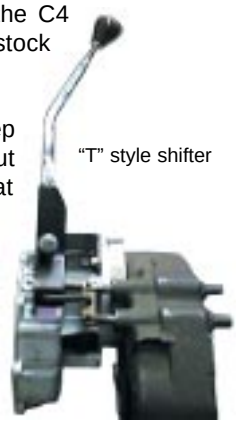
The early Ford Broncos have always been a popular vehicle for conversions. These vehicles were normally equipped with a 6 cylinder or V8 engine up to a 3 speed transmission. On this transmission, Ford used two different lengths of adapter housings when coupling this 3 speed to the stock transfer case. The adapter housing is either 6-1/2" or 9-3/8". Vehicles equipped with a V8 had a 9-3/8" tailhousing, which set the bellhousing further into the engine compartment. Vehicles with the 6 cylinder had a 6-1/2" tailhousing. This shorter adapter compensated for the longer engine. In 1973, Ford began offering the C4 automatic. A special tailhousing and output shaft was manufactured to couple this transmission to the stock transfer case. Ford no longer makes the C4 adapter.

The 1966-77 vehicles were equipped to a Bronco Dana 20 transfer case. This transfer case, unlike the Jeep Dana 20, has the front driveshaft on the driver's side of the vehicle. The input gear of this transfer case is 6 spline. Ford always used a spud shaft that coupled this 6 spline transfer case to the transmission 28 spline.

"J" style shifter

The transmission-to-transfer case adapters used both a dowel pin and alignment retainer. The spud shaft is supported in this retainer with a bearing. The adapter kits we manufacture utilize this type of design. In some applications, we also retain the stock spud shaft*. This transfer case has a 2.46:1 low gear ratio. In early 1973, Ford switch to a 2.34:1 low gear ratio.

"T" style shifter



These transfer cases used two different shifter designs known as either the "J" pattern or "T" handle. The "T" handle was used from 1966 to 1972, and the "J" pattern from 1973 to 1977. The "T" handle shifter is a fairly simple shifting mechanism and, to retain it with an adapter, only requires a pivot point for mounting. The "J" shifter requires the shift handle to be mounted in a location relatively close to its stock position. Retaining this shifter in its relatively stock location is hard to accomplish when adapting the various transmissions to the Dana 20. Vehicle owners having a "J" shifter are recommended to either change the transfer case shifter rods and go to a "T" style shifter or to contact one of the Bronco specialty shops that offer a twin stick replacement for the "J" shifter. A twin stick shifter replacing the "J" style should work with most of our adapters.

The adapter housings we manufacture normally utilize the stock Bronco crossmember with the stock rubber supports. On new transmission assemblies longer than stock, this crossmember may need to be relocated. There are a few adapters that require this crossmember to be modified. These modifications are noted in detail on the specific adapter instruction sheet.

The Bronco Dana 20 transfer cases are a good, reliable transfer case; however, as with anything they do have some weaknesses. One problem area is the output shaft. With the increase of horse power and the reduction of gears, more stress and strain gets put on the transfer case output shaft. We are proud to be the manufacturer of a 32 spline output shaft for the Bronco Dana 20 transfer case. This output shaft was designed and engineered by Wild Horses of Stockton, California. This heavy duty output shaft increases the output shaft straight up to 50% more than stock. This output shaft kit can only be purchased by contacting Wild Horses at (209)943-0991.

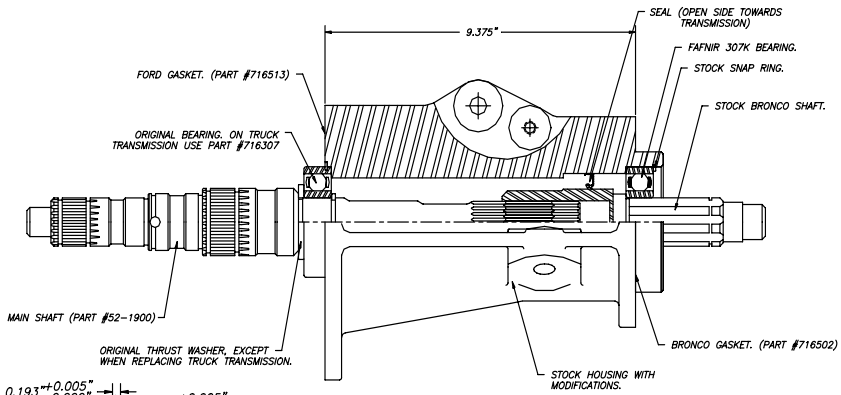
*Due to age, wear & tear, and the inability to locate stock Bronco spud shafts, we offer a stock Bronco replacement. This spud shaft (shown below) can be purchased from us under **P/N 52-2701**.

The stock Dana 20 transfer case measured 10-1/4" from the surface of the stock adapter housing to the face of the output yoke.

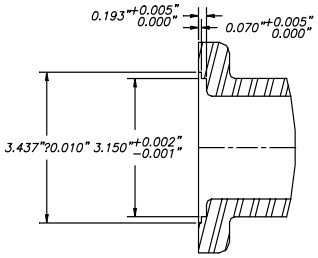
TRANSFER CASE ADAPTERS:

(Refer to **Pages 7 & 8** for additional transmission information)

T & C 4 speed: This transmission has the same bolt pattern and is 1" longer than the stock 3 speed transmission. This conversion kit consists of a new output shaft, shift rod bushing, and gasket kit. The 9-3/8" stock adapter housing is used and some machining is required. Your stock tail-housing must be drilled and reamed for the shift rail. The counter bore on the adapter housing must be machined to accept the larger 307 bearing. This kit utilizes the stock Bronco spud shaft. This transmission is side shifted and will require additional shifter components. Floorboard modifications will be necessary for shifter clearance and driveshaft modifications may be required.


9.375"
SEAL (OPEN SIDE TOWARDS TRANSMISSION)
FAFNIR 307K BEARING.
STOCK SNAP RING.
STOCK BRONCO SHAFT.
FORD GASKET. (PART #716513)
ORIGINAL BEARING. ON TRUCK TRANSMISSION USE PART #716307
MAIN SHAFT (PART #52-1900)
ORIGINAL THRUST WASHER, EXCEPT WHEN REPLACING TRUCK TRANSMISSION.
BRONCO GASKET. (PART #716502)
STOCK HOUSING WITH MODIFICATIONS.

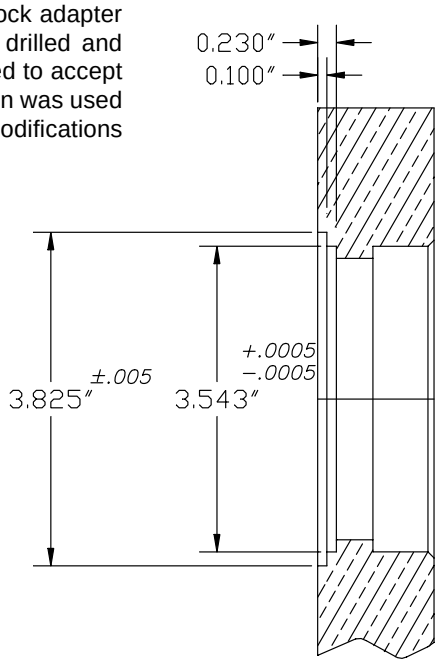
P/N 50-1900 - Ford T & C 4 speed to Bronco Dana 20
P/N 715503 - Hurst Competition Plus shifter bracket
P/N 715630 - Shifter rod kit
P/N 715600 - Hurst Competition Plus shifter & handle



BRONCO TAILHOUSING MODIFICATIONS.

Using gasket, determine location. Drill & Ream a 1" dia.hole x 1-1/4" deep. Install bushing P/N 716034.

T & C 4 Speed Overdrive: The bolt pattern & length of this transmission is 1" longer than the stock 3 speed transmission. This kit includes a new output shaft, shift rod bushing, and gasket kit. The 9-3/8" stock adapter housing is used and some machining is require. Your stock tailhousing must be drilled and reamed for the shift rail. The counter bore on the adapter housing must be machined to accept the larger 308 bearing. This kit utilizes the stock Bronco spud shaft. This transmission was used in both cars and trucks. We only offer a kit for the truck style transmisson. Floorboard modifications will be required and driveshaft modifications may be necessary. The truck-style transmission is top shifted and does not require any additional shifter components. Besides the shifter differences, these transmissions use two different rear output shaft bearings. Refer to **Page 8** for more information on this transmission.

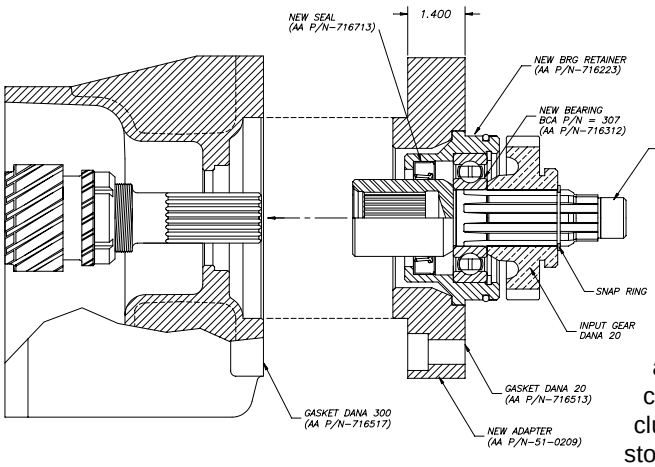


This kit can be used on a car style transmission; however, some machining will be required on the transmission main case. The car style transmission used a standard 307 series bearing. The truck case used a standard 308 bearing. The car style transmission would require the transmission main case to be machined, opening the rear bearing bore of the case to 3.543". The spacer washer behind the stock 307 bearing on the old main shaft will also require some machining. The inside diameter of the spacer needs to be opened to fit the new output shaft. Lastly, a new 308 bearing would need to be purchased.

P/N 50-5601 - Ford T & C Overdrive to Bronco Dana 20
(truck-style transmission 1985-89 F150s)

NV3550 5 speed: The NV3550 transmission is an ideal transmission swap for the early Broncos. This 5 speed is rated at 300 ft./lbs. at 7200 GVW. The weight of this 5 speed is 97 lbs., which is similar to the stock 3 & 4 speed transmissions. The overall size and length make it an ideal fit. The gearing of this 5 speed is as follows: 1st 4.01:1; 2nd 2.32:1; 3rd 1.40:1; 4th 1.00:1; 5th 0.78:1, and Reverse 3.57:1.

The transfer case adapter we manufacture for this transmission uses an adapter plate and spud shaft that couples to the NV3550 transmission. The adapter plate offers two rotation options for the Dana 20 transfer case: the stock rotation which is 42 degrees and a higher rotation of 34 degrees. The higher rotation may require a body lift for proper clearance. The transfer case adapter comes with a transfer case shifter linkage bracket which only fits the "T" style shifter.



The stock Ford bellhousing will also need to be adapted. The NV3550 has a 7-1/2" long input shaft. We manufacture an adapter plate that bolts to the front of this transmission. This adapter provides you with the proper indexing and bolt pattern to couple to the stock bellhousing. The stock bellhousing does require some slight modifications. Another consideration is the clutch disc spline. The stock Ford is 1-1/16" 10 spline, and the NV3500 is 1-1/8" 10 spline; therefore, a new disc is included in the adapter plate kit.

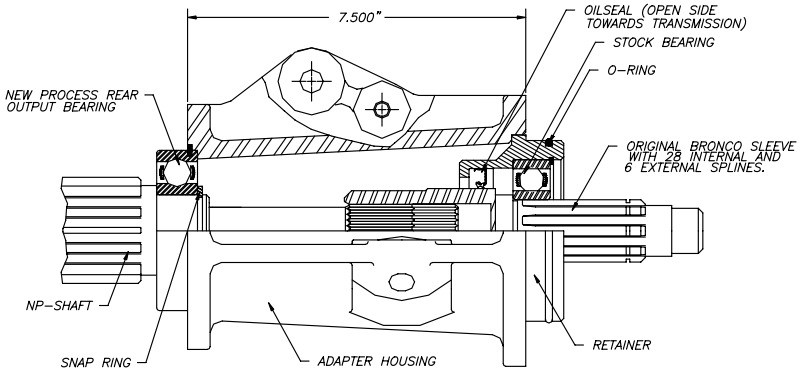
The new crossmember for the NV3550 transmission must also be used. Since this 5 speed does not offer the angular support pads and our adapter is too short to have these provisions, we designed a new crossmember support for the new transmission. Our new crossmember bolts to the stock crossmember frame hole and includes a new rubber support. The crossmember is designed to fit both stock exhaust and header applications.

P/N 50-9920 - NV3550 to Bronco Dana 20 T/C adapter (1.40" long)
P/N 712544 - NV3550 to Ford bellhousing 4.848" index (adapter length 7/8")
P/N 716000 - NV3550 crossmember support
P/N 26-3550- NV3550 transmission

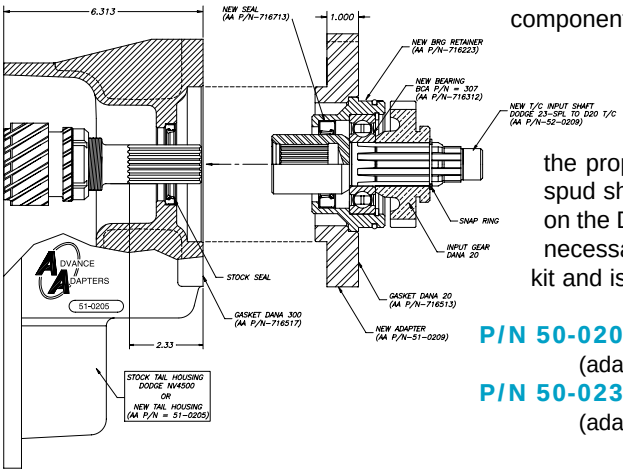
We offer a complete transmission package which includes the transfer case adapter, bellhousing adapter, crossmember, transmission, and shift handle under **P/N 27-3520**.

Ford NP435 & T18: These truck transmissions are a very popular choice for the early Bronco drivetrain. The kit includes an adapter housing, alignment retainer, seals and gaskets. The kit utilizes the stock transmission 2WD output shaft (28 spline), and the stock Bronco spud shaft. The adapter housing is drilled for both the 2WD NP435 & T18 transmissions. When installing the NP435 in a V8 application, this combination will not require any driveshaft modifications. The T18 is 1" longer than the NP435, requiring driveshaft modifications. Both transmissions will require some floorboard modifications to allow proper floorboard clearance. A sheet metal shop can fabricate a new tunnel coverplate to accommodate for this larger transmission. The stock shifter handle will most likely need to be modified. Also refer to the reprint article starting on **Page 38** of this manual.

P/N 50-2700 - NP435 & T18 to Bronco Dana 20
(adapter length of 7.500", tranny 10.875")



Dodge NV4500 5 speed: The NV4500 was introduced in 1993 and has been recognized as the ultimate manual transmission of choice. With a 5.61:1 low gear ratio, 27% overdrive and a synchro-reverse (not found in the Chevy NV4500), this transmission works well with the early Broncos. When installing these components, driveline and floorboard modifications will be required.


6.313
NEW SEAL (AA P/N-716713)
1.000
NEW BRG RETAINER (AA P/N-716223)
NEW BEARING BCA P/N = 307 (AA P/N-716312)
NEW T/C INPUT SHAFT DODGE 23-SPL TO D20 T/C (AA P/N-52-0209)
SNAP RING
INPUT GEAR DANA 20
GASKET DANA 20 (AA P/N-716513)
NEW ADAPTER (AA P/N-51-0209)
ADVANCE ADAPTERS
51-0205
STOCK SEAL
GASKET DANA 300 (AA P/N-716517)
2.33
STOCK TAIL HOUSING DODGE NV4500 OR NEW TAIL HOUSING (AA P/N = 51-0205)

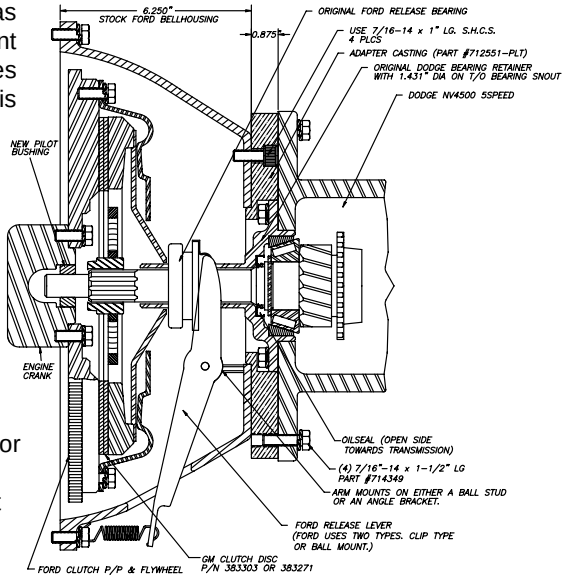
The adapters we manufacture only fit the Dodge standard duty NV4500 23 spline and 29 spline transmissions. The adapter we manufacture couples to the stock Dodge tailhousing. This adapter plate provides the proper bolt pattern and provision for a new alignment retainer and special spud shaft. The spud shaft is available both the 23 and 29 spline inputs found on the Dodge NV4500s. Our kit also supplies you with a new bearing, seal, and necessary hardware. A transfer case shifter bracket is included in the adapter kit and is only designed to fit the "T" style shifter (see photo below left).

P/N 50-0209 - *Dodge 23 spl. NV4500 to Bronco Dana 20 T/C adapter* (adapter 7.300", tranny 12.375")

P/N 50-0230 - *Dodge 29 spl. NV4500 to Bronco Dana 20 T/C adapter* (adapter 7.300", tranny 12.375")

Your Ford bellhousing will also need to be adapted. The Dodge NV4500 has a 7-1/2" long input shaft. We manufacture an adapter plate that bolts to the front of this transmission. This compensates for the longer input shaft and provides the necessary Ford bellhousing bolt pattern. Since the stock bellhousing is being retained, clutch linkage does not become a factor.

P/N 712551 - Dodge NV4500 to Ford bellhousing 4.848" index (adapter length 7/8")


6.250" STOCK FORD BELLHOUSING
0.875
ORIGINAL FORD RELEASE BEARING
USE 7/16-14 x 1" LG. S.H.C.S. 4 PLCS
ADAPTER CASTING (PART #712551-PLT)
ORIGINAL DODGE BEARING RETAINER WITH 1.431" DIA ON I/D BEARING SNOUT
DODGE NV4500 5SPEED
NEW PILOT BUSHING
ENGINE CRANK
OILSEAL (OPEN SIDE TOWARDS TRANSMISSION)
(4) 7/16"-14 x 1-1/2" LG PART #714349
ARM MOUNTS ON EITHER A BALL STUD OR AN ANGLE BRACKET.
FORD RELEASE LEVER (FORD USES TWO TYPES. CLIP TYPE OR BALL MOUNT.)
FORD CLUTCH P/P & FLYWHEEL
GM CLUTCH DISC P/N 383303 OR 383271

Another consideration is the clutch disc spline. The stock Ford is 1-1/16" 10 spline, and the NV4500 is 1-1/8" 10 spline; therefore, a new clutch disc will be required.

P/N 383735 -11" Centerforce clutch disc

"T" handle linkage installed on a NV4500

The transfer case adapter does not have provisions to retain the stock crossmember support. We offer both a new tubular crossmember and a NV4500 rubber support for supporting this transmission into the Bronco.

P/N 716000-4 - Crossmember support mount

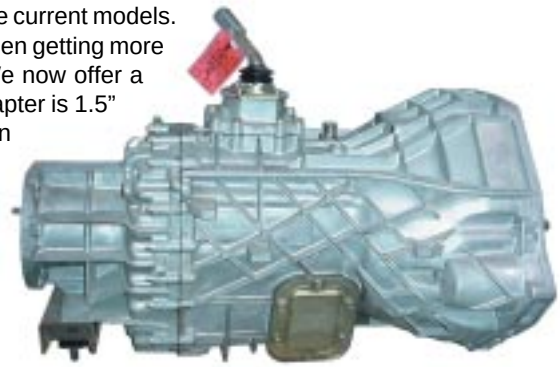
P/N 716101-2- Rubber mount

We offer a complete transmission kit which includes the components listed above except the 716000-4 crossmember. These kits also include a new NV4500 shifter handle and the NV001 instruction manual.

P/N 27-0044 - Dodge NV4500 23 spline transmission to Ford Dana 20

P/N 27-0044 - Dodge NV4500 29 spline transmission to Ford Dana 20

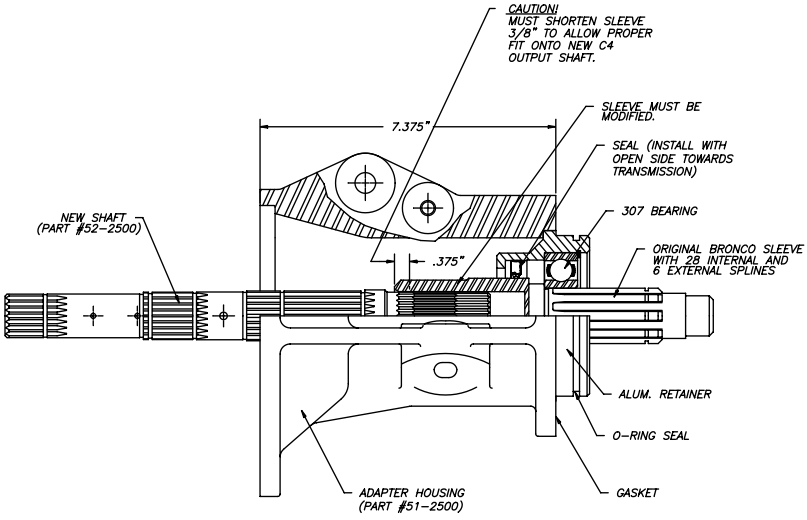
ZF 5 speed: The ZF 5 speed has been used in full size Fords from 1987 to the current models. These transmissions are now starting to show up in salvage yards, and we've been getting more requests for adapters to couple this 5 speed to the various transfer cases. We now offer a kit that couples the ZF transmission to the Bronco Dana 20. This aluminum adapter is 1.5" long and comes with a new spud shaft and alignment retainer. The installation of this transmission will require the fabrication of a new crossmember and transfer case shifter linkage bracket. The ZF 5 speed is a large transmission and, due to its size, driveline modifications and a body lift are required. This transmission has either a 4.65:1 or 5.72:1 first gear, and a 23% overdrive which makes it an ideal transmission for on and off road capabilities.



P/N 50-4303 - Ford ZF 5 speed transmission to Ford Dana 20

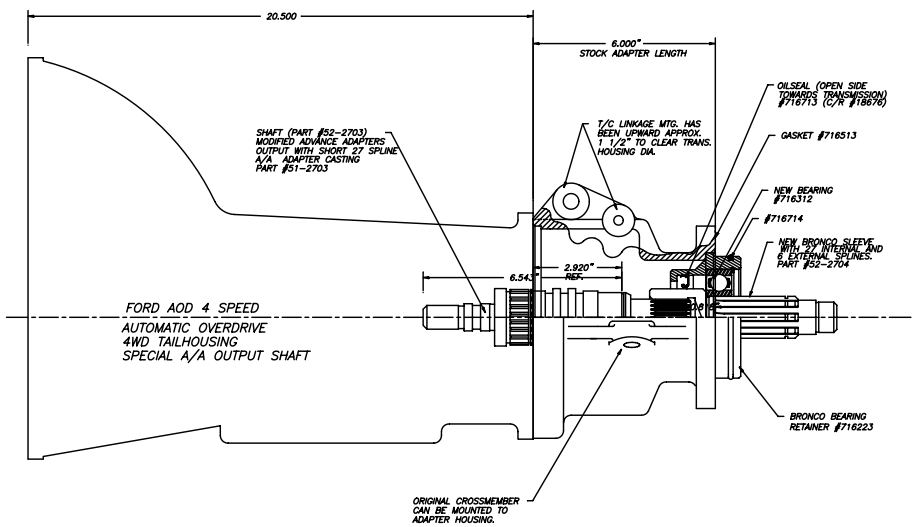
C4 3 speed automatic: Even though Ford used this transmission stock in vehicles from 1973-77, stock parts are no longer available. We manufacture a new aluminum adapter housing and a custom output shaft that is identical to the original Ford C4. This kit uses the stock Bronco spud shaft which may need to be shortened in some applications. No driveline modifications are required when replacing a manual 3 speed that was originally mated to a V8. The automatic shifter can be obtained from either 1973-77 Bronco, or a B & M cable-operated sport shifter can be used, **Part No. 715680**. For a short version C4 adapter see *Page 30* for details.

P/N 50-4200 - C4 automatic to Bronco Dana 20
(adapter length 7.375", transmission 17.000")



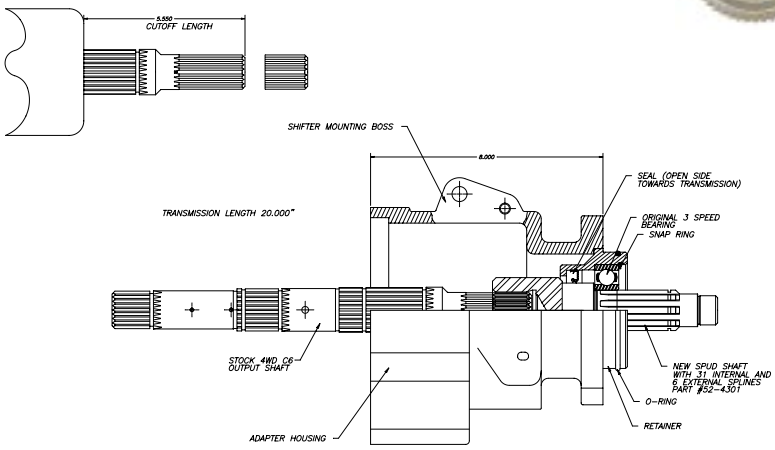
AOD & AODE: This automatic overdrive transmission has become very popular among Bronco owners. The gear ratio found in this transmission is great for trail and highway use. We manufacture adapters for both the early and late model AOD transmission. (Refer to **Page 7** for early and late model identification). This transmission assembly is 1-1/2" longer than the stock V8 assembly. It requires relocation and modifications to your stock crossmember. The "T" handle transfer case shifter is the easiest linkage to use, having only minor modifications. The "J" pattern can be used - but with a little ingenuity. The adapter kit comes complete with an adapter housing, main shaft, spud shaft, bearings and seals. The AODE transmission can be use on

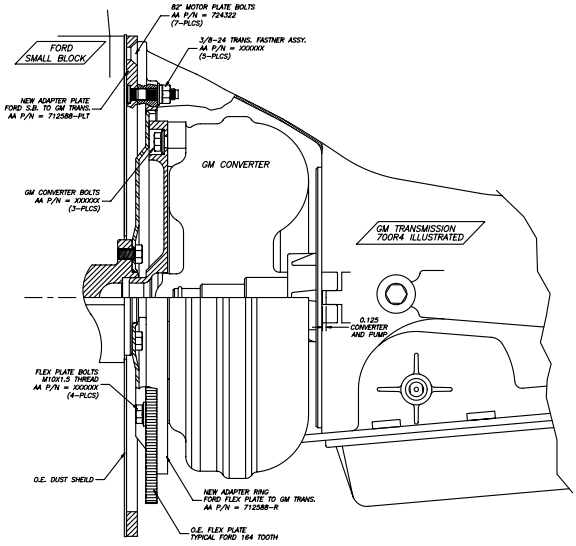
P/N 50-2703 - Early AOD (1980-87) to Bronco Dana 20
P/N 50-2704 - Late AOD (1988 & up) to Bronco Dana 20
(adapter length of 6.000", transmission 20.500")



C6 3 Speed Automatic: If you are installing a high horsepower V8 and want to use an automatic, this transmission is your best choice. The C6 tranny and adapter housing will be 2-1/2" longer than your factory setup. Driveline & crossmember modifications are necessary. The stock transfer case linkage will need minor modifications to fit on this adapter housing. This kit uses a stock 4WD C6 tailshaft with 31 splines. This kit also includes a new 8" adapter housing, spud shaft, and necessary bearings and seals. (*Note:* At one time, this kit included a custom C6 output shaft with 28 splines and used the stock spud shaft. This design was discontinued in 1998).

P/N 50-4301 - C6 to Bronco Dana 20
(adapter length of 8.000")



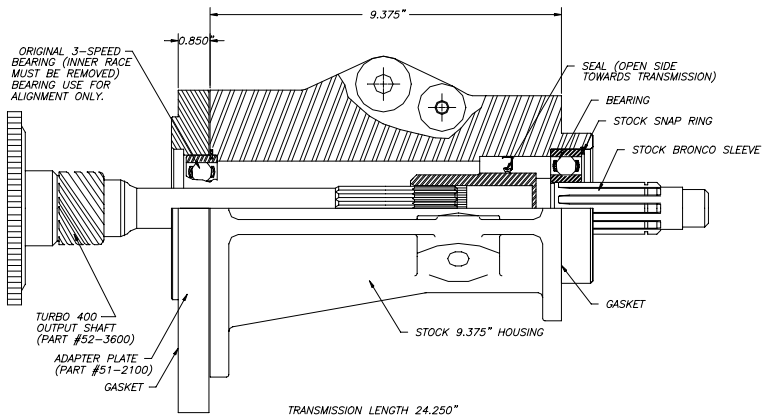


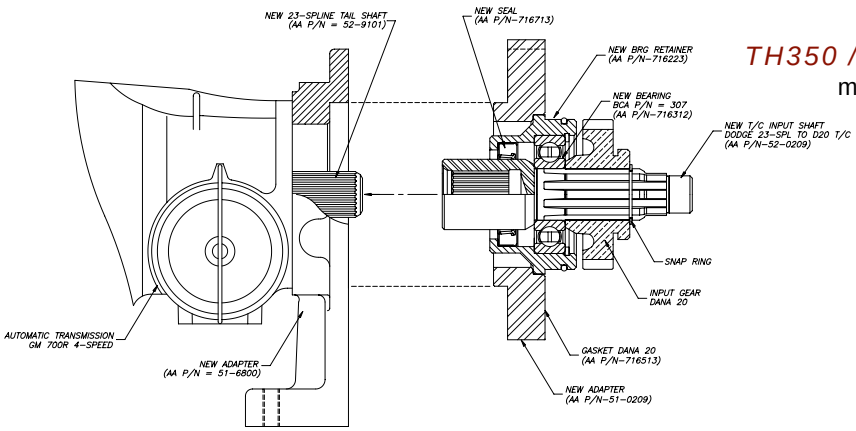
GM Automatic to Ford Small Blocks: We offer an adapter plate and flywheel adapter to couple the GM automatics (TH350, TH400 & 700R) to the stock Ford engine. This kit was mainly designed to fit the popular 700R up to the Ford small block. The 700R has the lowest first gear available in an automatic transmission, which makes this combination a sought-after transmission replacement for rock crawling enthusiasts. This kit comes complete with a 3/8" thick adapter plate, a torque converter adapter, and a flexplate for either the 28 oz. or 50 oz. balance blocks.

P/N 712588-A GM trans. to Ford 302 1968-80 (28 oz. balance)
P/N 712588-B GM trans. to Ford 302 1982-97 (50 oz. balance)
P/N 712588-C GM trans. to Ford 302 1981
(adapter plate thickness of .375")

TH400: We offer a few adapters for those who wish to convert to a GM drivetrain. This kit comes with a new TH400 output shaft that has been machined with the original Bronco 28 spline. This kit uses a 7/8" adapter and couples to the 9-3/8" stock 3-speed adapter. Due to the length of this transmission, plan on driveshaft modifications.

P/N 50-3600 -TH400 to Bronco Dana 20
(adapter length of .850", stock adapter 9.375", transmission 24.250")




NEW 23-SPLINE TAIL SHAFT (AA P/N = 52-9101)
NEW SEAL (AA P/N-716713)
NEW BRG RETAINER (AA P/N-716223)
NEW BEARING BCA P/N = 307 (AA P/N-716312)
NEW T/C INPUT SHAFT DODGE 23-SPL TO D20 T/C (AA P/N-52-0209)
SNAP RING
INPUT GEAR DANA 20
AUTOMATIC TRANSMISSION GM 700R 4-SPEED
NEW ADAPTER (AA P/N = 51-6800)
GASKET DANA 20 (AA P/N-716513)
NEW ADAPTER (AA P/N-51-0209)

TH350 / 700R: The kit includes two adapter housings, a main shaft, a spud shaft, and the necessary bearings and seals. This kit has gained popularity due to the introduction of Part No. 712588. Depending on what drivetrain is being removed, driveline and floorboard modifications may be required.

P/N 50-2706 - 700R to Bronco Dana 20
(adapter length of 2.500")
Special order - TH350 to Bronco Dana 20
(adapter length of 2.500")

The Atlas Transfer Case

1966-77 FORD BRONCOS

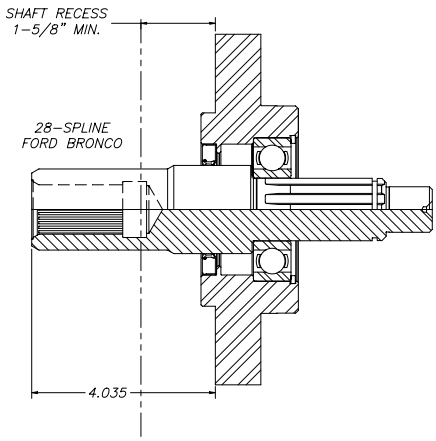
For the extreme 4-wheeler, we have engineered and designed the ultimate low-geared transfer case. The Atlas prototype was first tested in an early Bronco. The gross vehicle weight, tire size, and horsepower of this vehicle made an excellent test-bed. Even though the Bronco 20 is a good, reliable unit, the 2.46 or 2.34 low ratio is still not slow enough for today's trails. The Atlas is available in either a 2.0:1, 3.0:1, 3.8:1, 4.3:1, 5.0:1, and the 6.0:1 low gear ratio.

The Atlas is designed with the stock Bronco Dana 20 bolt pattern. Whether you are using one of our adapter housings or a stock Bronco tailhousing, the Atlas is a direct bolt-up. Instead of using an alignment retainer and dowel pin, the Atlas has its own indexing adapter plate. This plate is drilled with 2 rotation choices for a Bronco installation. The stock location is 42 degrees. For additional ground clearance, the unit can be installed at 35 degrees.

The Atlas is a synchronized gear box that can be shifted-on-the-fly into high range. This unit has twin sticks for shifting, allowing the unit to be used in 2-wheel low. The twin stick configuration was designed to be retained through the stock hole in the floorboard. The stock Bronco used C.V. yokes on both front and rear driveshafts. The Atlas transfer case comes complete with two new yokes of your choice. No modifications to the crossmember should be necessary. Front and rear driveshaft modifications are required.

FEATURES

- ✓ Helical Cut Gears
- ✓ Gear Driven
- ✓ Full Complement of Bearings
- ✓ Solid One Piece Case Design utilizing 356-T6
- ✓ Synchronized Shifting Shift-on-the-Fly capability
- ✓ Large Rear Output Shaft
- ✓ O.E.M. Speedometer Gear
- ✓ Twin Stick for enhanced Offroad Capabilities Enabling not only 4WD Low but also Front or Rear WD Low Capability
- ✓ Complete Unit These units are a Fully-assembled "Ready-To-Be-Installed" transfer case. There is no Retrofitting or machining for gear sets into your old transfer case, using old parts.



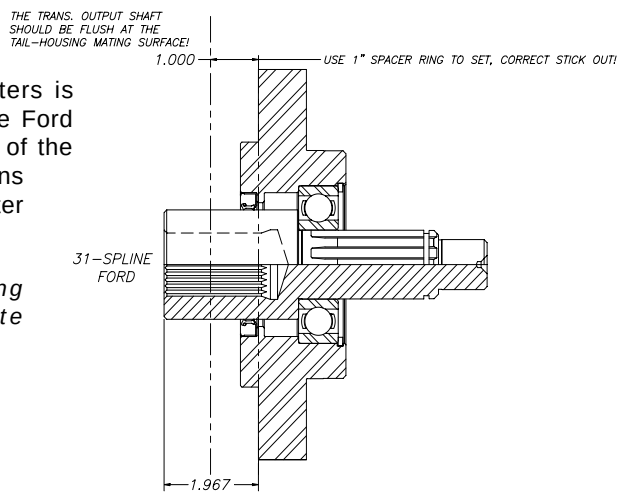
FORD 28 SPLINE:

The 28 spline Atlas was designed to fit *only* the 1966-77 Broncos. The stock transmissions used in these vehicles were normally coupled to a Dana 20 transfer case. The bolt pattern on the face of the Dana 20 is a 6-bolt hex pattern, in which we mirror this pattern on the Atlas transfer case. The rotation options of the Atlas into these vehicle are 42 degrees (which is stock), & 35 degrees (for additional ground clearance). NOTE: When bolting the Atlas up to an automatic C4 transmission, the Atlas short 28 spline is needed to avoid spline run-out. When using a NP435 or T18 transmission (with one of our adapter housings), the threaded portion of the transmission output shaft must be removed. The Atlas 28 spline offers two lengths. The **A28LS** fits the C4 transmission and the **A28L** fits the manual transmissions.

FORD 31 SPLINE:

The 31 spline Atlas was designed to fit the 4WD Full Size Ford transmissions. The stock transmissions used in these vehicles were normally coupled to either a NP205, NP208, or Borg Warner 1356. The bolt pattern on these transmission tailhousing adapters is identical to a stock Jeep. If you are using one of these Full Size Ford transmissions, caution should be used to avoid the spline portion of the shaft from "bottoming out" in the Atlas input shaft. Some applications may require shortening of the stock output shaft or a 1" spacer adapter **AS-0404**. The Atlas 31 spline is available in all gear ratios.

There are other input splines available for the Atlas depending on the transmission you are planning to use. For a complete application guide, please refer to the Atlas manual.



The Bronco Dana 20 transfer case has a stock rotation of 42 degrees. When installing the Atlas, we offer both this stock rotation and a 7 degree higher rotation for clearance. On the vehicle we installed the Atlas transfer case into, we opted to use the 7 degree higher rotation which provided extra front driveshaft clearance on the exhaust and crossmember. This rotation also allowed us a cleaner shifter installation. The only area of concern was the frame rail clearance, which we felt was still adequate. (On some applications, your brake lines may need to be moved to provide the extra clearance between the Atlas and your frame rail).

The project that we completed was on a 1977 Bronco with a late model injected 302, and a C4 automatic transmission. The information contained in this section was obtained while completing this installation. The biggest difference on this vehicle compared to other Broncos (with reference to the transfer case installation) would be the transmission that was either equipped stock or retrofitted. The Atlas should fit properly on all other applications; however, the shifter linkage or floorboard may need to be modified to obtain proper shifting clearance. Your Bronco should be equipped with a minimum 2" body lift. This will aid in shifter clearance.

The stock Bronco Dana 20 transfer case is normally indexed onto the stock adapter housing with an aluminum bearing retainer. When using the Atlas, this aluminum retainer will be removed because the Atlas has its own indexing plate. We have found on some stock adapter housings that Ford used a one piece adapter housing with a cast-in retainer. On these applications, your stock tailhousing adapter will need to be machined. If you find this to be the case, please contact us for the necessary machining processes or a replacement housing. Also, when removing the stock transfer case and exposing the tailhousing adapter, you'll find Ford used a large dowel pin located at the top of the stock housing. This dowel pin must be removed.

With the multitude of different transmission / transfer case combinations, spline engagement is always a concern. The Atlas was designed to obtain the utmost spline engagement. This presents a small problem in fitting the Atlas on some applications. Ford used two different transfer case input shaft lengths, so the stock Ford transmissions will have two different stickouts. Since this problem exists (and it's is nearly impossible to custom build each Atlas for each Bronco application), we have opted to design the input shaft of the Atlas to match the longest stock transfer case input that Ford used. On applications that had the shorter style input (C4 transmissions most common) such as the vehicle we completed, the Atlas input shaft must be shortened .300 inches. This is illustrated on your instruction sheet provided with the Atlas.

The speedometer housing on the Atlas transfer case is a stock '80-86 Jeep application. To hook your speedometer cable onto the Atlas, *Nevada Speedometer* offers the necessary components to couple your stock cable to the Atlas. If you vehicle's engine requires a pulse generator, they can also assist you in this area. Their telephone number is (775)358-7422.

On the stock Bronco Dana 20, the front driveshaft used a C.V. yoke to the transfer case. If you are installing the Atlas on a stock application (28 spline), we have included a C.V. yoke on the new transfer case. For applications using a full size Ford transfer case adapter housing or special conversion adapters (other than 28 spline), these applications would come with a non-C.V. front yoke. If you would like to retain a C.V. application, please inform the Advance Adapters salesperson before ordering.

The twin stick configuration for the Bronco applications was designed around the C4 transmission configuration. As already mentioned, there are numerous transmission options; therefore, this shifter configuration may not work in all vehicles. The instruction sheet that you will receive with your shifter kit indicates other options. You may be required to modify the shift handles to work in your vehicle.

Note: We have found on some stock C4 adapters and most stock 3 speed adapters that Ford used a one piece adapter housing with a cast-in retainer. On these applications, please contact us for the necessary machining processes for your stock adapter housing. If you have a C4 transmission and you wish to replace the stock casting, we also offer a new C4 housing, **P/N 51-2500**.

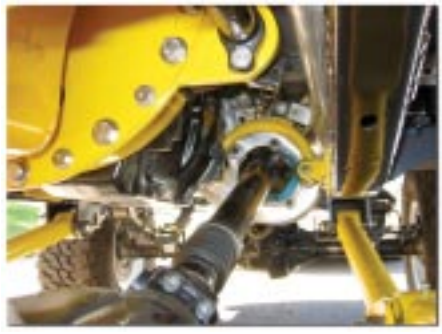
Photo of Jerry Hoffmeister's Bronco in Moab, UT

Rock crawlers request: As the popularity of rock crawling grows, so does the request for additional transmission adapters. We manufacture an adapter for the C4 transmission to the Atlas and Bronco Dana 20; however, the adapter is 7-3/8" long. For most vehicles this is not a problem. For the specialty rigs, the shorter the better. We now offer a new shorter C4 adapter. Unfortunately, this adapter will not fit the Bronco Dana 20 since it was mainly design is to fit the Atlas transfer case. The kit consists of a new 27 spline output shaft, adapter plate, housing, and crossmember mount. This short kit removes the governor from the transmission making it a manually shifted transmission, but for rock crawling that is ideal. The kit does require some addition machining to some components of the transmission. **Part No. 50-2903** is 2.940" long and comes complete with a full set of instructions.

"Off Road" series, heavy-duty Bronco 1966-77 302 motor mounts are now available. **P/N 713218**.

GM NV4500 and Atlas installation photos into a 1969 Bronco. These photos are courtesy of Bret Waddle owner of BRC Motorsports.com

The transfer case on this application was installed at 42 degrees. Rotations higher than stock may require frame modifications.



This application used a scatter sheild bellhousing since a GM NV4500 transmission was used. The custom crossmember was made by BRC Motorsport.

Ranger Torque Splitter

The **Ranger Torque Splitter Two-Speed Overdrive** has been the answer to gear splitting for nearly three decades. This unit was designed and developed by Warner Gear Corporation in the late 1960s. We purchased the unit in 1975, and have built hundreds of overdrive units since that time. The design has changed over the years, but the performance has stayed the same.

If you have a truck equipped with a 4 speed transmission and are having difficulty keeping the engine RPMs at peak range, then you need a Ranger Torque Splitter Overdrive. The Ranger simply provides a gear between each of your existing gears and converts your 4 speed to an "8 speed". When used as a gear splitter, you will be able to keep the engine RPM loss at a minimum, thus preventing the usual winding and lugging of the engine and 4 speed transmission. This works great for both diesel and gas pickup trucks.

With your engine coupled to the Ranger Torque Splitter Overdrive, your power can now be efficiently utilized with less engine wear, maintenance & downtime, and dramatically improve fuel economy. A typical example would be a Ford truck with a V8 engine and a 4 speed transmission that has an engine RPM of 2500 when driving 60 m.p.h. in 4th gear. This same truck, when equipped with the Ranger Overdrive and traveling 60 m.p.h. in 4th gear overdrive will have an engine RPM of 1825. This is a drop of 27% in engine RPMs for the same highway speed.

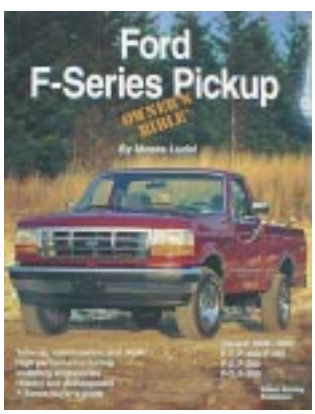
The Ranger Torque Splitter Overdrive has been designed for maximum ease of installation and requires no special tools. The front of the Ranger simply bolts directly to your existing bellhousing. Your 4 speed transmission indexes directly into the back of the Ranger. You will be required to have your driveshaft shortened by your local driveline specialist. The Ranger is 7-1/2" long and will require the relocation of your 4 speed transmission shift lever.

The internal design of the Ranger Torque Splitter Overdrive consists of a T98 synchronizer coupled with precision helical cut gears. The gear assembly is mounted on roller & ball bearings that will provide a maximum torque range of 420 ft./lbs and it has a G.V.W. rating of 25,000 lbs. Each unit is furnished with a shift control handle that has been designed for use in most pickup trucks. The splitting of gears does require shifting of both the stock 4 speed shift lever and the Ranger shift lever. The clutch must be used when shifting the unit.

The Ranger is currently available in either an **OVERDRIVE** or **UNDERDRIVE** gear ratio. The difference between the two is that the final gear ratio on overdrives will have a 27% RPM reduction, while the underdrive gear ratio will have a 17% RPM increase. The underdrive gearbox is normally used when the truck is equipped with high rear axle ratios, and gear splitting is the primary purpose. The overdrive is the most popular, since most installations require both an overdrive and a gear splitter.

The Ranger is compatible with all manual transmissions whether in 2WD or 4WD. Since the location is ahead of the transmission and transfer case, the overdrive and gear splitting capabilities can be used in 4WD. The installation of the Ranger in your vehicle will not require the continual use of all eight forward gears. Depending on your requirements, you need not always use all eight gears. Whether loaded or unloaded, on the highway or in the city, the Ranger offers you the opportunity for a great investment that makes your truck fit your driving requirements.

FORD OWNERS BIBLE by Moses Ludel



Part # FOB

The Ford Owners Bible is a great addition in educating yourself regarding your vehicle. The book is a hands-on guide to getting the most from your Full size vehicle.

High-performance modifications, accessories, vehicle history, and tips you should know when buying a new or used vehicle, are just a few of the many topics covered by the well known technical writer Moses Ludel.

FOLDING STEPS

Part # 716870

This entry step was primarily designed for raised vehicles and provides easier accessibility into the cab. This step is spring loaded and folds downwards approximately 6", and upon release folds back upwards to avoid being knocked off when off-roading. The steps are polished aluminum and look great on most vehicles.

Ford Full Size Trucks

Full Size Ford trucks are not the most popular for transmission upgrades. Over the years, we've only had a few requests for certain adapters. Most of the early Ford trucks produced had either a single gear ratio Dana 21 transfer case or they had a divorced New Process transfer case. The Dana 21 was very light-duty and, therefore, not very popular to adapt to. The divorced New Process transfer cases were good gear boxes; however, no adapters were required when changing transmissions, just a custom driveshaft did the job.

Around 1977, the first Ford married transfer cases came on the scene. From 1977 to 1979, both the NP205 & NP203 transfer cases were found in Ford trucks. Both New Process transfer cases used a 31 spline input; however, the bolt patterns were different. Since the NP203 was discontinued in 1979, we have never made any adapters for this transfer case. In 1980, Ford changed transfer cases to the New Process 208 and the Borg Warner fullsize 1300 series. They still offered the NP205 on special order applications. The transfer cases (NP205, NP208, and the various fullsize B/W 1300 series) found in these vehicles are all basically treated the same when it comes to adapting to them. They all have a circular 6 bolt pattern, a 31 spline input, and the same index diameter. The New Process 205 has one difference that does play a part with our adapters. The adapter requires a clearance notch for the stock transfer case shifter linkage. Since these Ford transfer cases all have the same basic configuration, the task of swapping a Ford 4WD transmission with another Ford 4WD transmission can normally be accomplished with the stock adapter.

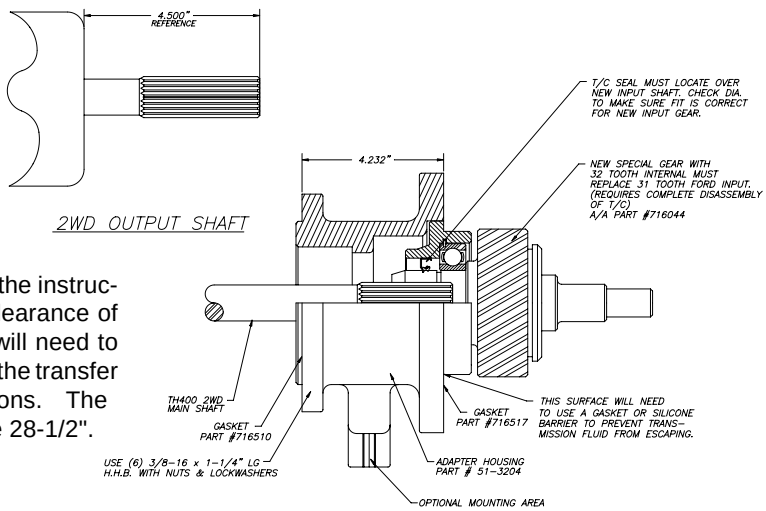
The adapters we manufacture are designed to couple the different Chevy automatic transmissions and the NV4500 5 speed transmission to the Ford transfer cases. We also have designed bellhousing adapters to couple the Chevy automatics and the NV4500 transmission to the stock Ford engines.

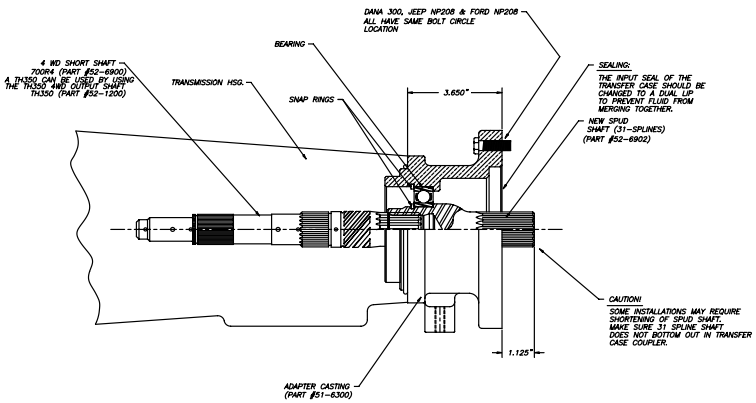
FORD TRUCK TRANSFER CASE ADAPTERS:

P/N 50-3204

GM TH400 to Ford NP205 T/C adapter

This adapter kit is for a stock 2WD TH400 transmission adapting to a Ford NP205 transfer case. The TH400 output shaft is 32 spline and the stock NP205 has a 31 spline input. This kit replaces the 31 spline input gear with a new 32 spline input gear. The new 32 spline input will then couple to the stock TH400 output shaft. This new gear is a direct interchange with the original Ford input gear. The aluminum front index retainer of the NP205 requires one lathe machining operation, which is noted on the instruction sheet. The adapter housing has been modified for clearance of the transfer case shift controls. When using this kit you will need to fabricate a new transfer case pivot support for the handle of the transfer case. Most installations will require driveline modifications. The overall assembled length of the adapter and TH400 will be 28-1/2".


4.500" REFERENCE
2WD OUTPUT SHAFT
T/C SEAL MUST LOCATE OVER NEW INPUT SHAFT. CHECK DIA. TO MAKE SURE FIT IS CORRECT FOR NEW INPUT GEAR.
4.232"
NEW SPECIAL GEAR WITH 32 TOOTH INTERNAL MUST REPLACE 31 TOOTH FORD INPUT. (REQUIRES COMPLETE DISASSEMBLY OF T/C) A/A PART #716044
TH400 2WD MAIN SHAFT
GASKET PART #716510
GASKET PART #716517
THIS SURFACE WILL NEED TO USE A GASKET OR SILICONE BARRIER TO PREVENT TRANSMISSION FLUID FROM ESCAPING.
USE (6) 3/8-16 x 1-1/4" LG H.H.B. WITH NUTS & LOCKWASHERS
ADAPTER HOUSING PART # 51-3204
OPTIONAL MOUNTING AREA


DANA 300, JEEP NP208 & FORD NP208 ALL HAVE SAME BOLT CIRCLE LOCATION
BEARING
4 WD SHORT SHAFT 700R4 (PART #52-6900) A TH350 CAN BE USED BY USING THE TH350 4WD OUTPUT SHAFT TH350 (PART #52-1200)
TRANSMISSION HSG.
SNAP RINGS
3.650"
SEALING: THE INPUT SEAL OF THE TRANSFER CASE SHOULD BE CHANGED TO A DUAL LIP TO PREVENT FLUID FROM MERGING TOGETHER.
NEW SPUD SHAFT (31-SPLINES) (PART #52-6902)
CAUTION! SOME INSTALLATIONS MAY REQUIRE SHORTENING OF SPUD SHAFT. MAKE SURE 31 SPLINE SHAFT DOES NOT BOTTOM OUT IN TRANSFER CASE COUPLER.
1.125"
ADAPTER CASTING (PART #51-6300)

P/N 50-6904

GM 700R to Ford NP208 or B/W Fullsize 1300 series Transfer case adapter

This kit comes with a new output shaft that must be installed into your transmission. We then use a spud shaft to couple the new 700R output to the Ford 31 spline transfer case. The 3-5/8" long adapter mates these two components together. The front side of the transfer case will need to have the dowel pin removed in order to accept the new adapter housing. Test fit the adapter to the transfer case and make sure that the new 31 spline spud shaft does not bottom out inside your transfer case input. The transfer case linkage will need to be fabricated for use with this adapter. If using this kit on a NP205 transfer case, the adapter will need to be modified for shifter linkage clearance.

P/N 50-0207 - *Dodge standard duty NV4500 23 spline to Ford NP205 & NP208 T/C adapter*
P/N 50-0220 - *Dodge standard duty NV4500 29 spline to Ford NP205 & NP208 T/C adapter*

These kits allow the Ford NP205 and NP208 transfer cases to couple to the Dodge NV4500 transmissions. There are a couple of modifications required when using these adapters. All Ford transfer cases, whether NP205 or NP208, always require a 31 spline male output shaft. We have seen some variations as to the stickout length of this 31 spline output shaft. Before assembling the new transmission to your transfer case, you should compare the stickout length to the original transmission and make the necessary adjustments. It is required to shortened the stock NV4500 output shaft. The cut off location can be adjusted for the desired stickout length of your new 31 spline spud shaft.

In order to provide clearance for the shift mechanism on the NP205 transfer case, you must make a small relief area in the original 4WD tailhousing. The instruction sheet provides detailed instructions for this procedure. We do not offer any brackets for the transfer case shifter handle of the transfer case. Therefore, fabrication of a bracket is required.

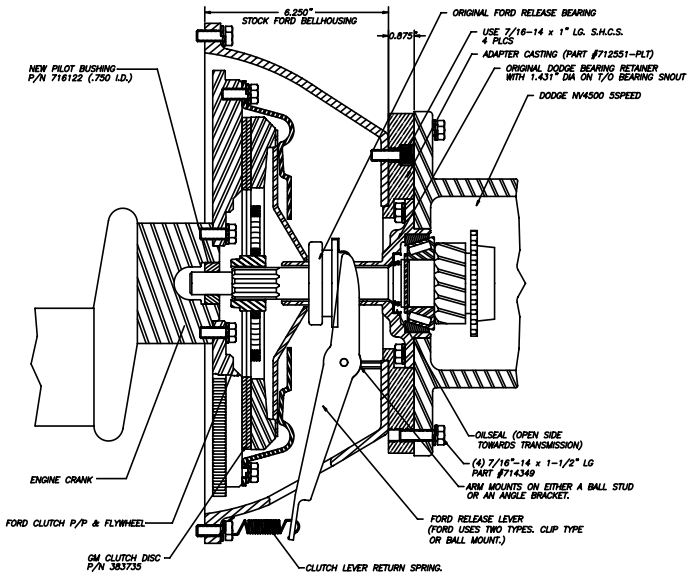
FORD TRUCK BELLHOUSING ADAPTERS:

P/N 712588-A *GM trans. to Ford 302 1968-80 (28 oz. balance)*
P/N 712588-B *GM trans. to Ford 302 1982-97 (50 oz. balance)*
P/N 712588-C *GM trans. to Ford 302 1981*

We offer a flexplate and adapter plate to couple the GM automatics (TH350, TH400 & 700R) to the stock Ford 302 engine. This kit was mainly designed to fit the popular 700R up to the Ford small block. The 700R has the lowest first gear available in an automatic transmission, which makes this combination a sought-after transmission replacement for rock crawling enthusiasts. This kit comes complete with a 3/8" thick adapter plate, a torque converter adapter, and a flexplate for either the 28 oz. or 50 oz. balance blocks.
(Adapter plate thickness of .375")

P/N 712551 - *Dodge NV4500 adapter plate to standard Ford bellhousing 4.848" index*

This adapter plate is only compatible with transmissions equipped with the standard duty Dodge input shaft. The input shaft on the front of the transmission must be a 1-1/8" 10 spline and a stickout length of 7-1/2". The bellhousing on the Ford engine must have the smaller 4.848" bore. This adapter plate is not compatible with the larger 5.125" bellhousing. The adapter plate is also not compatible with bellhousings that are longer than 7". The bearing retainer on the front of the Dodge transmission already has the correct size for the Ford clutch release bearing. This kit includes a new pilot bushing, adapter plate, and hardware.


6.250" STOCK FORD BELLHOUSING
0.875"
ORIGINAL FORD RELEASE BEARING
USE 7/16-14 x 1" LG. S.H.C.S. 4 PLCS
ADAPTER CASTING (PART #712551-PLT)
ORIGINAL DODGE BEARING RETAINER WITH 1.431" DIA ON T/O BEARING SNOUT
DODGE NV4500 5SPEED
NEW PILOT BUSHING P/N 716122 (.750 I.D.)
OILSEAL (OPEN SIDE TOWARDS TRANSMISSION)
(4) 7/16"-14 x 1-1/2" LG PART #714349
ARM MOUNTS ON EITHER A BALL STUD OR AN ANGLE BRACKET.
ENGINE CRANK
FORD CLUTCH P/P & FLYWHEEL
FORD RELEASE LEVER (FORD USES TWO TYPES. CLIP TYPE OR BALL MOUNT.)
GM CLUTCH DISC P/N 383735
CLUTCH LEVER RETURN SPRING.

P/N 712549
GM engine to Ford transmission (Full bellhousing)

This full bellhousing fits a stock Ford transmission with the 4.848" bearing retainer and a 6.5" long input shaft. The bellhousing kit comes complete with a new pilot bushing and release arm. Since the bellhousing couples the Chevy engine to the Ford transmission, you will have a mix of clutch components. The Chevy components are the pressure plate and release arm, and the Ford items are the clutch disc and release bearing. The recommended flywheel for this bell-housing is a Chevy 11". The bellhousing is drilled and tapped to accept the stock transmissions 7/16"-14 bolts.

NV4500 TRANSMISSION KITS:

P/N 27-0040 - *NV4500 transmission package to Ford NP205. O.A.L. of 27.500"*

This kit includes the bellhousing adapter plate (712551), transfer case adapter (50-0207), a NV shifter handle, and rubber crossmember support (716101-2). The transmission that is required for this kit is P/N 26-0016, which has a 23 spline output. If your transmission has a 29 spline output shaft, you can exchange P/N 50-0207 with P/N 50-0220.

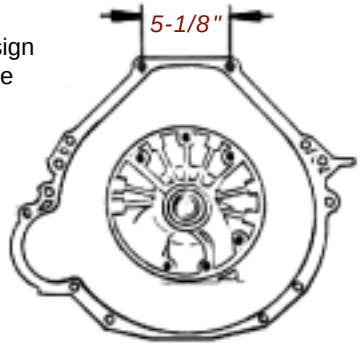
P/N 27-0049 - *NV4500 transmission package 2WD application*

This kit includes the bellhousing adapter plate (712551), a NV shifter handle, and rubber crossmember support (P/N 716101-2). This kit is designed to fit the Dodge 2WD transmission.

460 V8 Engine Components for all Ford Trucks & Bronco Conversions

The replacement of the small Ford V8 and straight 6 cylinder engines have become quite popular in Ford trucks. One of the main reasons for this is that the 460 cubic inch big block is readily available in most salvage yards. We offer engine mounts that will bolt directly to the Ford 429/460 engine blocks and will match the frame rails on most applications. These mounts fit the 4WD F-series pickups from 1977 to 1990, 2WD F-series pickups from 1978 to 1990, and Broncos from 1978 to 1990. The stock frame perches can be used on most applications. The location of the frame perches should be 12-3/8" from the face of the bellhousing to the center of the stock frame perch stud hole. On a few applications, the frame perch may need to be relocated. On 1979 & earlier 6 cylinder vehicles, a new driver's side frame perch must be installed.

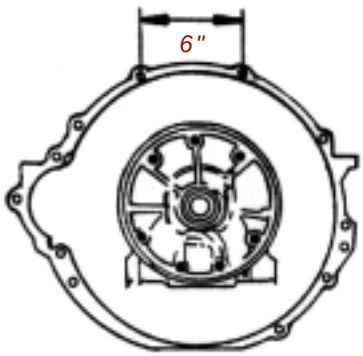
We also offer complete frame-to-block engine mounting systems. These mounts are a rugged design Off Road style mount manufactured for us by Autofab manufacturing. The four different mounts we carry fit 1965-79 2WD trucks, 1977-79 4WD trucks, 1978-79 Ford Broncos and 1980-96 2WD/4WD Ford trucks.



289-302-351C-351W

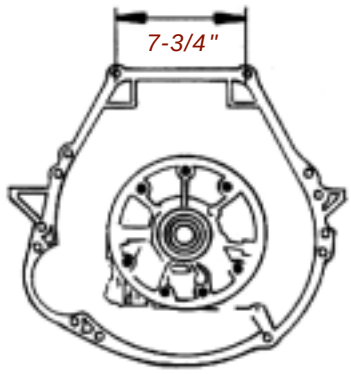
The various Ford engine blocks used three different bolt patterns. When replacing an engine in a vehicle that originally had a manual transmission, the bellhousing will need to be changed. When converting vehicles with automatics, the entire transmission casing will need to be replaced. The following blocks are grouped together by block bolt pattern configuration.

Small Block Fords: 289, 302 and 351 Windsor all have the same block bolt pattern.
Ford Blocks: 332, 352, 360, 390, 406, 427 and 428 all have the same block pattern.
Ford Blocks: 429, 460, 351M and 400 all have the same block bolt pattern.



332-352-360-390-406-427-428

Both the 429 or 460 engines can be used for this conversion. When purchasing your new engine, you will have several options as to what vehicle the engine is obtained out of. Acquiring a 460 out of an early F-series or E-series is good donor application. We have also found that the late '80s and early '90s F250 & F350 had the 460 engine as an option in the Ford trucks. These engines would also be good donor application. If you are buying a take-out engine from a wrecking yard, make sure you get a complete engine with all the accessories and brackets.



429-460-351M-400

BODY LIFT:
A body lift is mandatory for 1979 & earlier vehicles. On later model vehicles, a body lift will aid in the installation of the engine, but it is not mandatory.

WATER PUMP:
The original water pump that is purchased with your engine should work fine without any changes.

ACCESSORY BRACKETS:
Most Ford accessories are interchangeable within the stock Ford brackets.

ALTERNATOR:
Your original V8 alternator can be retained without disconnecting any of the wiring. It may be easier to use the new 460 alternator rather than try to change back to the old alternator.

RADIATOR MODIFICATIONS:
The radiator will definitely need to be changed in order to provide enough cooling capacity for your new engine. We have seen some truck models equipped with heavy duty towing packages that are already equipped with a volume large enough to handle the 460 engine.

OIL FILTER:
The stock oil filter can be used except on vehicles that are equipped with IFS suspension. Oil filter clearance is not a problem

on vehicles equipped with solid axles. Due to the tight clearances in the engine compartment, we have found it easier to use a remote oil filter adapter kit on most conversions. **AA Part No. 716084**.

STARTER MOTOR:
The Ford V8 requires that the starter motor be bolted to the bellhousing. For this reason it is imperative that, before installing your engine into your vehicle, you check your flywheel and starter for proper engagement and indexing.

AIR CONDITIONING:
The original air compressor can be reused on the new engine. You should be able to unbolt the compressor assembly without disconnecting the compressor hoses. The original straight 6 or 302 V8 brackets will not be compatible with the new engine.

FAN:
You will find that the new 460 engine will be almost 2" longer than the 302 with a standard water pump, and 4.5" longer than a small block 302 with a serpentine water pump. This will require the fan spacers to be shortened and also require new radiator hoses.

OIL PAN:
In order to install the 460 engine into a 4WD truck, it is essential that you use the rear sump oil pan. This pan assembly is common to almost F-series and E-series Fords from 1980-96.

FLYWHEEL & FLEXPLATE:
The 460 block from 1979-97 is externally balanced and the 1978 & earlier is internally balanced. Make sure you match the flywheel or flexplate to the year of block you are using. On manual transmission applications, we offer both a 11" and 12" clutch assembly. The Ford 460 used a 176 tooth flywheel / flexplate. Make sure that the starter has proper tooth engagement.

MANUAL TRANSMISSION BELLHOUSING:
The original bellhousing and flywheel cannot be used with your new engine. You must obtain a bellhousing from a 351M or a 400 engine. When obtaining a new bellhousing, be sure that you select one that has the necessary clutch linkage mounting bracket. Bellhousings for the Ford engines are available in three different categories. The easiest way to determine the correct bellhousing is to measure the distance between the top two holes where the bellhousing bolts to the engine block. You must obtain one that has a distance of 7-3/4". The transmission patterns have all been the same; hence there should be no problem in bolting the original 4 speed to your new bellhousing. The bellhousing is available in two transmission indexing diameter sizes. These sizes are either 4.848" or 5.125". Make sure that your new bellhousing has the proper diameter for your existing transmission.

In order to use the original transmission, you will need to change the bellhousing, flywheel, pressure plate & clutch disc.

Ford 11" Flywheel	
Centerforce 11" Pressure Plate	#CF360033
Centerforce 11" Clutch Disc	#281226
Release Bearing	#N1714 (1983 & Up)
Release Bearing	#N1439 (Up to 1982)
Ford 12" Flywheel	#700280 (1979 & UP 176 TOOTH)
Centerforce 12" Pressure Plate	#CF261015
Centerforce 12" Clutch Disc	#384200
Release Bearing	#N1714 (1983 & Up)
Release Bearing	#N1439 (Up to 1982)

IGNITION SYSTEM:
The original Ford wiring harness can normally be retained with some minor adaption to the new distributor. Distributors from 360 and 390 engines will need to be replaced. Distributors from 351C, 351M and 400 engines can all be used with the new engine. Caution should be given to the correct firing order, and we suggest that you refer to a Ford manual for the correct specifications.

EXHAUST SYSTEM:
The stock 460 manifolds can normally be retained, and a 2-1/2" dual exhaust system can be easily adapted to the stock manifolds. If headers are desired, then we suggest contacting Hedman Hedders.

AUTOMATIC TRANSMISSION:
The original automatic transmission that was bolted to the straight 6, 302, 351W, 360 & 390 engines will not be compatible with the new 460 engine. If your vehicle is a 2WD conversion, then we simply recommend changing the original transmission to the C6 transmission with the correct engine block pattern. If your vehicle is a 4WD model, then you should take considerable caution not to obtain a transmission with the long tailhousing. Some 4WD models have the transfer case married directly to the transmission, while other models have the short drive shaft between the two. When removing the original engine that was

equipped with an automatic transmission, we recommend that the engine be separated from the transmission case. In order to do this, you will be required to remove the (4) nuts and bolts that connect the transmission flexplate to the transmission torque converter. Access to these four bolts can be obtained through the transmission inspection cover located on the backside of the engine block.

ENGINE MOUNTS:

We offer several options for swapping the 460 into Ford trucks and Ford Broncos. Depending on the use of the vehicle we, offer a mount that will suit your needs. For the avid offroader we offer a complete frame-to-block "extremely strong" mounting system; or for the trucks that see more of the street, we offer our conversion mount. Either mounting system works great for the Fords in all applications.

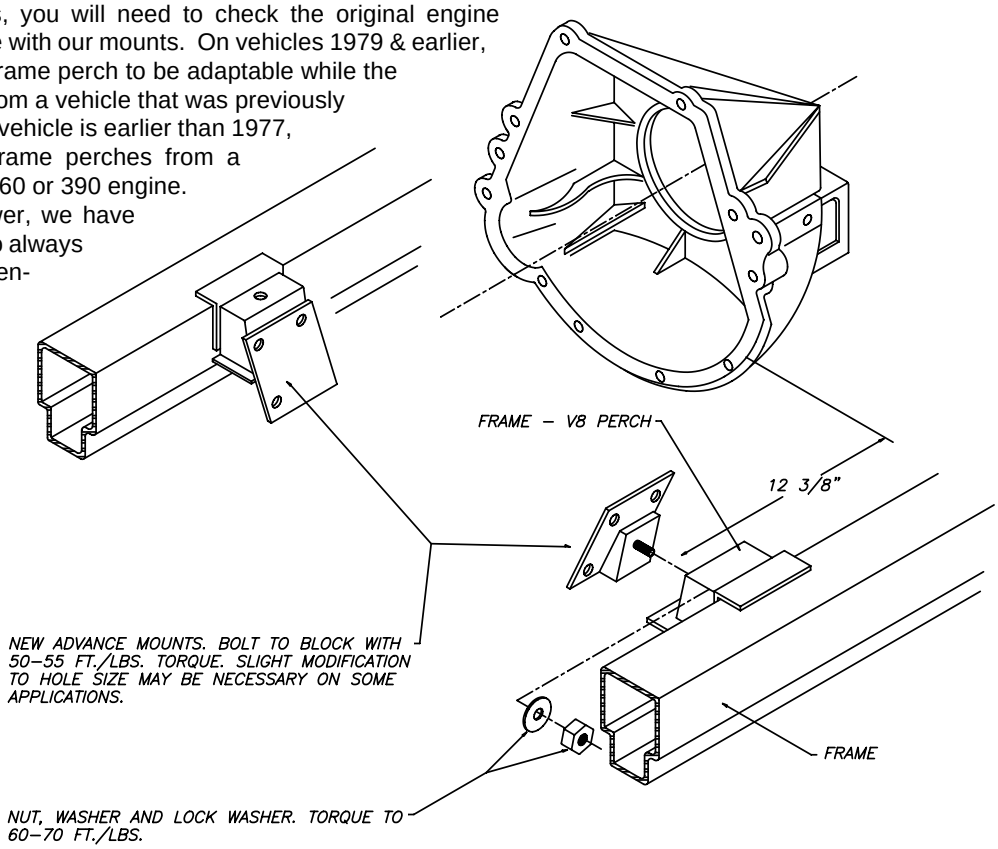
AA Part No. 713014 is a conversion mount that retains the stock frame perch. The mounts are designed with a slight slope for allowing the large block engine to mate perfectly with the new frame crossmember. With the engine mounts in the proper location, the stud portion will extend through the stock crossmember and then the hex nuts can be tightened. Make sure that the engine is sitting level before final tightening. It is *very critical* that you establish the stud location at the definite 12.375" from the face of the bellhousing or face of the new automatic transmission.

We have found it necessary to install *"limiting straps"* on all 460 V8 engine conversions. Our mounts have a special inner-lock mechanism built inside the rubber insulator. The torque of the large V8 engine can be so extreme that it is possible to pull the motor mount rubbers apart if a limiting strap is not installed. The strap is required on both the driver's side and passenger side. This strap is not provided with our motor mount kit.

When replacing a 302 or 351W engine, you must make sure that the frame perches are in a location that will meet the 12.375" required stud hole location. On most applications, the existing frame perches will be in the correct location.

When replacing a 360 or 390 engine, you will need to reposition the passenger side frame perch to the 12.375" specification. The driver's side should already be in the proper location. Once again, we suggest that you verify both engine stud locations before final engine positioning.

When replacing 6 cylinder engines, you will need to check the original engine perches to see if they are compatible with our mounts. On vehicles 1979 & earlier, we have found the passenger side frame perch to be adaptable while the driver's side needs to be replaced from a vehicle that was previously equipped with a 351 engine. If your vehicle is earlier than 1977, then we suggest you obtain the frame perches from a vehicle previously equipped with a 360 or 390 engine. On 6 cylinder vehicles 1980 & newer, we have found the driver's side frame perch to always be in the proper location. The passenger side frame perch will need to be changed to one from a 302 or 351W engine installation. We have had a few people tell us that the original 6 cylinder frame perches can both be used - with only slight modifications.


FRAME – V8 PERCH
12 3/8"
NEW ADVANCE MOUNTS. BOLT TO BLOCK WITH 50–55 FT./LBS. TORQUE. SLIGHT MODIFICATION TO HOLE SIZE MAY BE NECESSARY ON SOME APPLICATIONS.
FRAME
NUT, WASHER AND LOCK WASHER. TORQUE TO 60–70 FT./LBS.

If you looking for the ultimate in strength and reliability, then look no further. We now offer a new series of mounts called our "Off Road" mounts. These mounts are built by "Auto Fab" and they are a complete engine mounting system frame-to-block. These rugged mounts use a horizontal neoprene bushing to isolate the engine from the frame. They are a heavy-duty offroad type of mount that will take the torque abuse of the 460 engine.

P/N 713222 - 1965-79 2WD 460 *"Off Road"* mounts

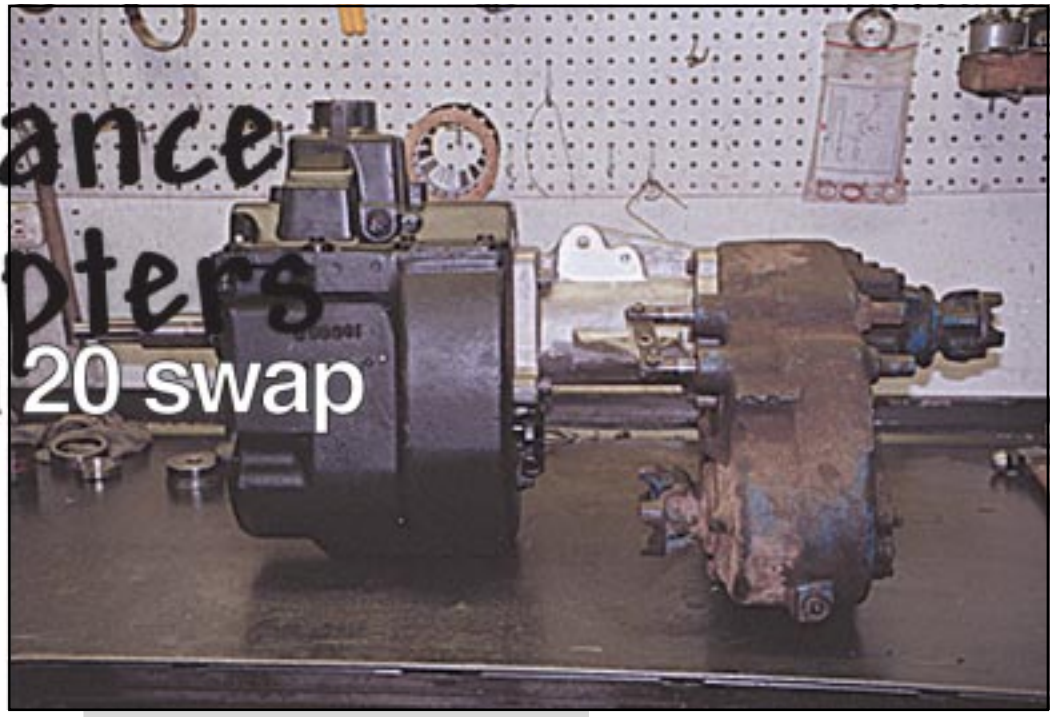
P/N 713223 - 1977-79 4WD 460 *"Off Road"* mounts

P/N 713223B - 1978-79 BRONCO 460 *"Off Road"* mounts

P/N 713224 - 1980-96 2WD/4WD 460 *"Off Road"* mts.

For those of you looking for a GM V8 engine, we also offer a mounting system for the 1965-79 2WD Ford. **P/N 713219**

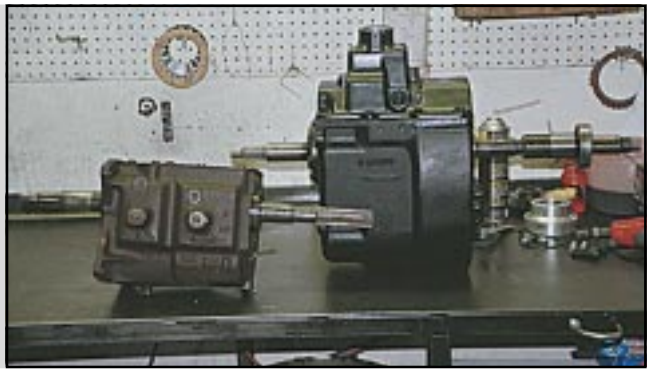
435 Advance Adapters to Dana 20 swap



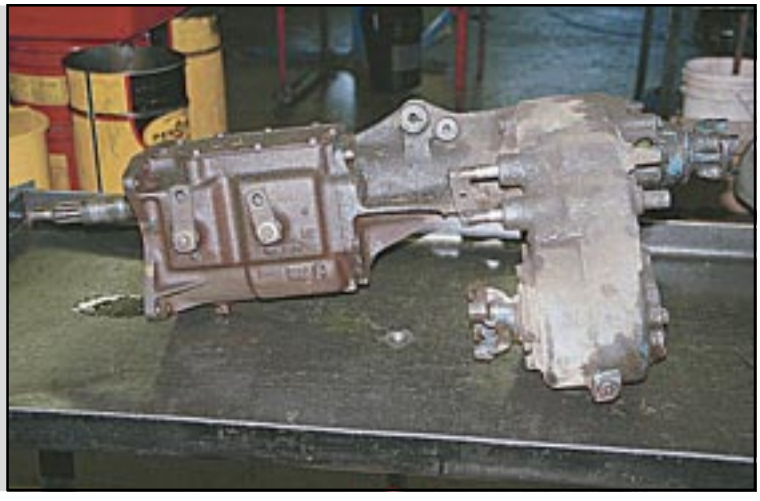
When it comes to transmission and engine swaps, the experts at Advance Adapters are the ones to turn to. This adapter works with NP 435 and T-18 to Dana 20 t-cases that were found in early Broncos.

Transmission upgrades are very popular in the off road world, and Advance Adapters has long been the leader in engine and transmission conversions. Some stock transmissions were very competent for their intended use but when high output engines, bigger drivetrain parts and large tires surround a stock unit they have a tendency to fail. Today's wheelers are also looking for the lowest gear possible in the transmission and transfer case to allow for more highway friendly gears in the differentials. One of the popular choices for low gear four speeds is the NP-435. T-18's are also very popular but are in high demand making them harder to find. The NP-435 can be somewhat overlooked for the toughness needed for off-road use. Like the T-18, 19 trannies, the NP is synchronized in only the top three gears and contains a first gear below 6:1. However, being an inch shorter, the NP can sometimes save grief with driveline angles in some vehicles.

1966-76 Broncos came standard with a three speed manual transmission and an optional automatic, which were popular for their time. With today's higher traffic volumes and speed limits, the three speed leaves a lot to be desired. The NP 435 is a perfect mate for the Bronco. In conjunction with the Advance Adapter, it is probably on of the easiest tranny swaps to do.

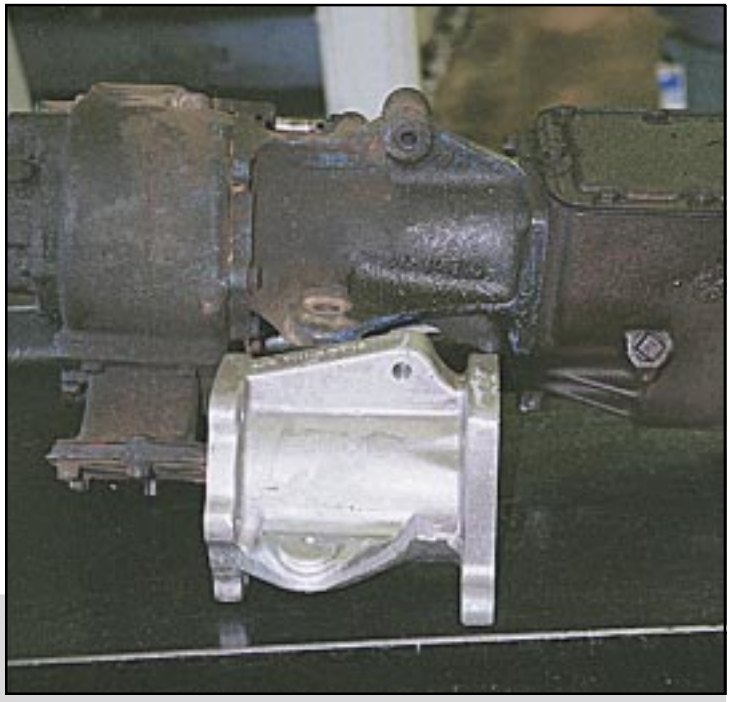


If you have never disassembled a Dana 20 t-case before, it comes apart a little strange. The output shaft is first installed into the adapter then inserted into the transfer case. Roller bearings are inserted individually inside the t-case for the shaft to roll on. What this means is, when you take the adapter off, the bearings will fall loosely about the inside of the t-case. Make sure you get them all! It may take fishing with a magnet.



Story/Pictures by: Albert Vandervelde, 4WD Magazine, www.can4x4.com

Early Broncos (Pre-76) are great candidates for the four speed-435, many of these popular trucks came with three speeds that leave a little to be desired. The NP-435 is the perfect transmission for these vehicles. It could well be one of the easiest transmission upgrades you could perform. The NP-435 is quite a bit larger and longer than the stock three speed, yet with the installation of the adapter from Advance, stock driveline positions are maintained. This makes the installation simple, stock looking, and also enables the use of the stock driveshafts reducing the overall cost of the installation. The only modification needed beyond the adapter is the cutting of



The new adapter from Advance is two inches shorter than the original unit. This compensates perfectly for the NP-435 transmission. As the overall length remains the same, the stock driveshafts can be reused.

The new Adapter from Advance comes in two parts. The Dana 20 shaft is first pressed into the collar at left, then tapped into place inside the new adapter housing. Everything is a very tight fit.

Keeping the t-case leaned back offers the best chance to keep all the bearings in the cup inside. We still managed to lose one down into the PTO adapter on the bottom of the case. We were able to get the roller bearing by fishing inside with a flexible magnet.

Stock Bronco three speed ratio:

1st - 2.99:1
2nd - 1.75:1
3rd - 1.00:1

NP 435 ratio:

1st - 6.99:1 2nd - 3.34:1
3rd - 1.66:1 4th - 1.01:1

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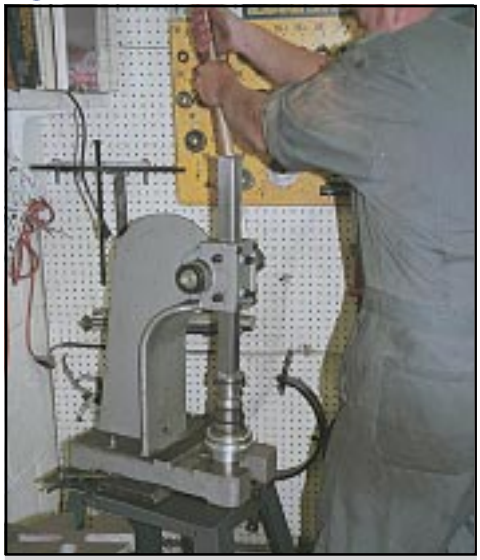

A hand press makes quick work of most bearing installations. The Dana 20 shaft and bearing need to be pressed into the collar supplied with the Advance Adapter.

Everything fits very snug in the adapter.

A tape with a plastic hammer was needed to seat the collar and shaft into the adapter housing. The adapter is then installed onto the t-case, then attached to the transmission.

a hole in the floor for the new stick shift and a bend or two in the shifter itself. NP-435s can be commonly found in 1969-1979 Ford trucks, but the adapter from Advance does not fit the GM and Dodge version of the NP-435.

Now it's time to get those pesky roller bearings back into the t-case. A thick lubricant like vaseline, or in the case of a tranny shop, Assembly Goo (yes that is the brand name) is used to hold the bearings in place until the adapter is installed. Once filled with gear oil, the assembly goo dissolves into the oil.

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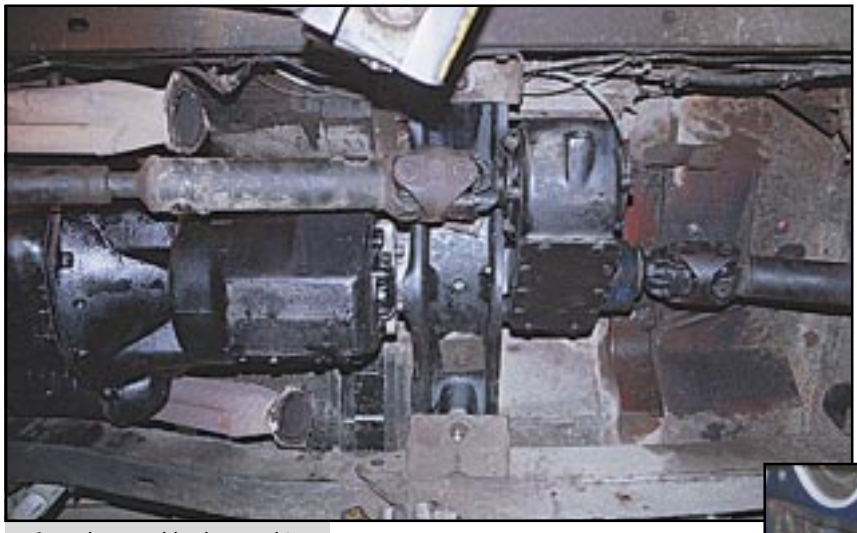
Advance offers a multitude of manuals that provide useful information needed before performing engine or transmission swaps. Give them a call and order one for your vehicle before you take another step.

Once the adapter is installed into the t-case, the Dana 20 and new adapter can then be bolted to the 435 tranny.

The shifter is relocated to the centre of the transmission hump which requires a hole for the shifter tower.

The old location was beside the driver's right leg. This shifter cam out of a 1978 Ford Bronco equipped with the 435. Alittle bending will still need to be done in order for the shift to miss the transmission stick.



Complete and in the truck!

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